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# Playing the trump card: Why we select overconfident leaders and why it matters

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## ABSTRACT

Five studies test the relationship between overconfidence and perceived leadership suitability. Study 1, a field study wherein HR consultants assessed candidates for an advertised leadership position, finds that overconfidence positively predicts hiring recommendations. Study 2, in which participants delivered a five-minute job talk to an expert panel, finds that overconfidence buffers social stress, thereby improving participants' job pitches. Study 3, which tested the effect of confidence on leadership selection at different levels of manipulated competence, finds that regardless of competence, confidence increases perceived leadership potential. Study 4, finds that within the context of the 2016 US Primaries, voters were swayed by candidates' confidence, regardless of candidate competence. Study 5, an agent-based simulation, demonstrates that if candidates adjust to voter preferences for confidence, competent candidates become less likely to be elected. These findings suggest that overconfidence manifests behavioral displays that activate people's implicit leadership theories, thereby increasing perceptions of leadership potential.

## Introduction

Confidence is a compelling trait for an aspiring leader to possess (Hogan, Curphy, & Hogan, 1994; Kirkpatrick & Locke, 1991; Magee & Frasier, 2014), giving rise to behavioral signals – strong opinions, defined ideas, a calm and relaxed bearing, and a general demeanor of self-assurance – that others read as competence and leadership potential (Anderson & Kilduff, 2009). However, because overconfidence gives rise to these very same behavioral signals (Driskell, Olmstead, & Salas, 1993; Radzevick & Moore, 2011), selection committees are faced with the challenge of differentiating between those candidates whose confidence is warranted, and those whose confidence arises from an exaggerated belief in their actual competence (i.e., the overconfident). Indeed, we suggest that the degree to which candidates *misperceive themselves* to possess superior competence, relative to the reality of their actual competence, influences the nature and strength of the behavioral signals they emit, and ultimately, the impression they leave on selection committees. Such is the focus of this paper, wherein we suggest that due to its self-deceptive nature, candidates' overconfidence seamlessly piggybacks on the information value of confidence, triggering implicit theories or schemas of leadership, and providing an advantage in the context of leadership selection.

Leadership scholars have thus far produced scant empirical work on

the role of candidates' overconfidence in leadership selection contexts. This is not to say that the clues are not there – we know that overconfidence (operationalized as overestimation of past performance) has been observed in emergent leadership (Reuben, Rey-Biel, Sapienza, & Zingales, 2012). Narcissism, a conceptual cousin of overconfidence, has also been shown to be positively related to leadership emergence and performance (Grijalva, Harms, Newman, Gaddis, & Fraley, 2015; Nevicka, De Hoogh, Van Vianen, Beersma, & McIlwain, 2011), especially during the initial stages of team formation (Ong, Roberts, Arthur, Woodman, & Akehurst, 2016). Leadership emergence has also been shown to be related to high general self-efficacy (Foti & Hauenstein, 2007), which in turn has been used to explain the robust association between confidence and effective leadership (McCormick, 2001). In addition, overconfidence, operationalized as overestimation of precision in forecasts of project payoffs, has been modeled in corporate leadership promotion (Goel & Thakor, 2008). Specifically, Goel and Thakor (2008) find that within the context of an intrafirm tournament, wherein managers compete to maximize shareholder value, overconfident managers overestimate the precision of private information, leading them to underestimate project risk. This increases outcome variance, which on a good day increases firm value and the likelihood of the overconfident manager being promoted to CEO. However, Goel and Thakor (2008) also demonstrate that the relationship between

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overconfident CEO's and firm value is non-monotonic – while moderate overconfidence diminishes underinvestment and increases firm value, higher levels of overconfidence lead to overinvestment, which decreases firm value.

We make four empirical and theoretical contributions to the literature with this work. First, we explicate contrasting theoretical accounts concerning the functional utility of overconfidence – intrapersonal (Dunning, Leuenberger, & Sherman, 1995; Taylor & Brown, 1988) versus interpersonal (Anderson, Brion, Moore, & Kennedy, 2012; Murphy et al., 2015; von Hippel & Trivers, 2011) – and we move toward ‘consensus creation’ (Hollenbeck, 2008) by demonstrating the relationship between these intrapersonal and interpersonal advantages that follow from overconfidence. Specifically, using Brunswik's (1956) lens model as a conceptual framework, we demonstrate that overconfidence leads to an advantage in leadership competitions (i.e., the interpersonal account) *because* of the intrapsychic buffer against social stress that it provides (i.e., the intrapersonal account). Most previous studies on the positive effects of overconfidence in the context of leadership have focused on leadership emergence (e.g., Grijalva et al., 2015; Reuben et al., 2012). While it is true that the qualities that facilitate leadership emergence and selection likely overlap, the processes are quite distinct. Emergence occurs naturally within groups and without the premeditated intention of selecting a leader, whereas selection follows from identifying a need for a leader who is then purposely sought out and scrutinized by a panel or committee in an effort to assess his or her leadership potential. As such, leadership competitions differ from emergent leadership contexts insofar as they have the potential to evoke a stronger stress response. We suggest that leadership selection contexts may be especially well suited to the anxiety buffering effects of overconfidence and the confidence signaling that follows.

Second, we advance implicit leadership theory by suggesting that overconfidence acts as an intrapsychic mechanism that manifests behaviors that then activate implicit theories or schemas associated with leadership. Implicit leadership theory is a cognitive theory of leadership which posits that decision-makers possess schemas that shape their implicit theories of what constitutes a leader (Calder, 1977; Den Hartog et al., 1999; Epitropaki & Martin, 2004; Lord, Foti, & De Vader, 1984; Lord, Foti, & Phillips, 1982; Offermann, Kennedy Jr., & Wirtz, 1994). Individuals who fit people's shared leader-related theories or schemas tend to emerge as leaders within groups (Brown & Lord, 2001; Hogg, 2001). Surprisingly, (over)confidence has not yet been explicitly identified as a schema-activating component of implicit leadership theories, despite longstanding recognition of the importance of confidence to leadership (Hogan et al., 1994; Kirkpatrick & Locke, 1991; Magee & Frasier, 2014). Nonetheless, Lord et al.'s (1984) seminal work on implicit leadership theory produced a pool of 59 leader attributes, nine of which are conceptually related to (over)confidence – outgoing, determined, decisive, strong character, strong convictions, charismatic, persuasive, persistent, outspoken. We build on these suggestive findings by positioning candidate overconfidence as an antecedent of these leader prototypic behavioral expressions identified by Lord et al. (1984).

Third, we answer calls to generalize laboratory findings regarding the status enhancing effects of overconfidence to a field setting (Anderson et al., 2012) where we offer the first empirical investigation into the effects of overconfidence in leadership selection. Although status and leadership are conceptually different (e.g., Goldhamer & Shils, 1939; Magee & Galinsky, 2008), previous theoretical conceptions indicate that status involves leadership and vice versa (e.g., Bales et al., 1951; Berger et al., 1972) and that both concepts correlate very highly (Anderson et al., 2012). We thus expect that any status enhancing benefits of overconfidence will be especially pronounced in a leadership selection context, where there is a strong preference for holistic, intuitive approaches that rely on behavioral observations from interviews and other assessment center exercises (Highhouse, 2002, 2008; Lievens, Highhouse, & De Corte, 2005). These more intuitive approaches tend to

gather little objective information that would allow testing the accuracy of the candidate's confidence signaling and may therefore leave selection panels vulnerable to misperceiving mere overconfidence as justified confidence that is matched by high competence.

Fourth, using a two-pronged approach (i.e., experimental and cross sectional) we contribute to the ongoing discussion regarding the boundaries of (over)confident signaling, when such signaling is accompanied by cues of low competence (Kennedy, Anderson, & Moore, 2013; Tenney, Spellman, & MacCoun, 2008). First, using an experiment, we examine the robustness of the effects of overconfident signaling when paired with objective evidence of candidates' competence levels. We then test these relationships in one of the most important leadership competitions – the 2016 US presidential elections – where we again examine the effects of perceived confidence on voting intentions at different levels of perceived competence. Finally, using an agent-based simulation we extrapolate from the observations made in the context of the 2016 US election and provide an illustration of the longer-term societal consequences of selecting overconfident leaders into top political positions.

While we ground this work in the context of leadership selection and implicit leadership theory, it will no doubt be of interest to researchers interested in leadership emergence, charismatic and transformational leadership, power and status, and those following the important discussion of managerial judgments and decisions and their impact on firm performance (Chatterjee & Hambrick, 2007; Hayward & Hambrick, 1997; Hiller & Hambrick, 2005; Li & Tang, 2010; Malmendier & Tate, 2005; Roll, 1986; Mishina, Dykes, Block, & Pollock, 2010).

### Theory and hypotheses

#### Leadership selection

Leadership selection refers to a formal process in which (i) the need for a leader is recognized, (ii) potential candidates are identified, (iii) those candidates are given the opportunity to be considered by a panel or committee, (iv) whose task it is to scrutinize the appropriateness of the candidates for the role. In some cases, this will involve the consideration of external candidates, though more frequently those selected for formal leadership roles are existing organizational members whose particular skills, abilities, and characteristics are “visible” and perceived to be well matched to leadership (Fiedler, 1996). As such, leadership selection is founded on people's implicit leadership theories and leadership prototypes (Lord et al., 1982; Lord et al., 1984; Lord & Maher, 1990; Vardiman, Houghton, & Jinkerson, 2006). If a target individual is seen to fit the prevailing leadership prototype, they are more likely to be viewed as a leader and to win deference and respect within informal social hierarchies. These individuals gain visibility and social capital, which enhances their chances of eventually being selected for a formal leadership position (Vardiman et al., 2005). There is a wealth of empirical research on the individual traits and characteristics that feed into leader prototypicality, with intelligence/cognitive ability, emotional intelligence, conscientiousness, extraversion, dominance, emotional stability, gender role, and generalized self-efficacy being the most reliable predictors of leader emergence and selection (e.g., Day, Shleicher, Unckless, & Hiller, 2002; Fitzsimmons & Callan, 2016; Gershenoff & Foti, 2003; Lord, De Vader, & Alliger, 1986; Rubin, Bartels, & Bommer, 2002; Smith & Foti, 1998; Taggar, Hackew, & Saha, 1999; Wolff, Pescosolido, & Druskat, 2002). Although (over)confidence does not yet explicitly feature as a constituent of leader prototypicality, there is strong suggestive evidence in the existing literature to motivate the current research. We review and discuss these throughout the following sections.

#### Defining overconfidence

To understand how overconfidence might provide an advantage to aspiring leaders it is important to understand what is meant by

overconfidence and to consider the roots of the error. Overconfidence is broadly defined as an inaccurate and exaggerated perception of one's abilities or knowledge (for a review, see Moore & Healy, 2008). People can be overconfident in three main ways: 1) they might *overplace* themselves relative to others by believing themselves to be better than others, even when they are not (e.g., Kruger & Dunning, 1999; Kruger & Mueller, 2002; Larrick, Burson, & Soll, 2007), 2) they might *overestimate* their abilities or performance relative to objective criteria (e.g., Buehler, Griffin, & Ross, 1994; Krueger & Wright, 2011), or 3) they might exhibit *overprecision* by expressing excessive certainty regarding the accuracy of their knowledge or beliefs (e.g., Hill, Gray, Carter, & Schulkin, 2005; Daniel, Hirshleifer, & Sabrahmanyam, 1998). Thus, people are overconfident either when they believe themselves to be more competent than is warranted by objective measures of competence, and/or when they believe themselves to be better than others when in fact they are not.

Overconfidence is not equivalent to the strong confidence of a person of high competence whose self-knowledge is accurately calibrated, although we contend both result in the same behavioral displays. Whereas confidence gives rise to behavioral signaling that reflects one's *actual* abilities or potential, *overconfidence* manifests as *falsely inflated* signals of one's competence. This distinction between confidence and overconfidence is an important one as it implies observers *should* infer different information from overconfidence and confidence. Nonetheless, we suggest that because the overconfident are unaware that their self-opinions are inflated, they do not emit the telltale signs of conscious bluff or deceit, which can be observed or detected by others (Vrij, Edward, Roberts, & Bull, 2000), and which tend to result in perceptions of overconfidence and social disapproval (e.g., Colvin, Block, & Funder, 1995; Jones & Shrauger, 1970; Schlenker & Leary, 1982; Tenney et al., 2008).

#### Contextualizing (over)confidence within implicit leadership theory

Although research investigating the role of overconfidence in leadership is limited (Meikle, Tenney, & Moore, 2016), there is a clearly documented relationship between confidence and leadership (De Cremer & Van Knippenberg, 2004; Hogan et al., 1994; Kirkpatrick & Locke, 1991; Magee & Frasier, 2014), suggesting the possibility that confidence may feature in people's implicit theories of what constitutes a leader. For instance, confident leaders tend to accept more challenges and set more difficult goals (Luthans, Luthans, Hodgetts, & Luthans, Luthans, Hodgetts, & Luthans, 2001), to be less sensitive to risks (Black & Porter, 2000; Northouse, 1997), and to inspire followers to work toward their objectives (Luthans & Peterson, 2002). We suggest that even when confidence is not well matched by ability, as is the case with overconfidence, it will still activate people's implicit leadership schemas, and so increase perceptions of leadership potential.

As early as 1948, Stogdill identified self-confidence as predictive of emergent leadership. Hollander's (1958) notion of *idiosyncrasy credits*, which are granted to legitimate leaders, might provide license for, and even expectations of displays of confidence and bold self-assurance. Indeed, Kirkpatrick and Locke (1991, p. 54) astutely observed that "not only is the leader's self-confidence important, but so is others' perception of it." They go on to describe how displays of self-confidence inspire followers' self-confidence, as well as confidence in the decisions made and directions set by the leader. This sentiment emerges again in the work of De Cremer and Van Knippenburg (2004, p. 142) who state that "by communicating the expectation of success, leader self-confidence may render the leader more attractive and charismatic, and motivate involvement in the job." And in their work on the foundations of power and status – both closely tied to leadership (e.g., Eden & Leviatan, 1975) – Magee and Frasier (2014) describe how perceptions of power are primarily based on displays of confidence, assertiveness, and the appearance of being in control.

Alongside these accounts of the centrality of confidence to leadership, implicit leadership theory has to date invoked only an implicit

relationship between confidence and leadership. As noted above, although the earliest attempts to produce a list of qualities that feature in people's leadership schemas did not explicitly identify confidence *per se*, roughly 15% of the 59 leader-related constructs that were identified follow from or overlap with the construct of confidence (Lord et al., 1984). To the extent that (over)confidence might, as we suggest, activate people's implicit leadership schemas, the more a target individual appears confident, the more likely it is that he or she will be categorized as a leader (Foti & Luch, 1992; Offermann et al., 1994). Once such a label is in place, selective attention and memory will reinforce the initial judgment, even if the label is not subsequently justified by objective data (Shondrick, Dinh, & Lord, 2010).

#### Related constructs

Scholars have also explored what we see as conceptually related constructs, such as leader hubris (Judge, Piccolo, & Kosalka, 2009), charismatic leadership (Antonakis, Bastardo, Jacquart, & Shamir, 2016; Antonakis, Fenley, & Liechti, 2011), and even transformational leadership (Bass & Riggio, 2006). We briefly review these related streams of research to contextualize overconfidence in relation to these constructs.

Hubris refers to exaggerated pride, self-confidence, or arrogance (De Vries, 1990). In part, leaders' hubris is a consequence of the consistent deference shown to leaders by obsequious followers (De Vries, 1990). In the absence of question, challenge, or rebuke, leaders' hubris blooms and can give rise to poor decisions. For instance, Owen and Davidson (2009) described the role of hubristic behaviors among American presidents, linking these to events such as the American sponsored Bay of Pigs invasion, Nixon's Watergate scandal, and Bush's decision to invade Iraq. We see strong parallels between hubris and overconfidence, and indeed, the two constructs have at times been used interchangeably (e.g., Hayward, Shepherd, & Griffin, 2006). However, others (e.g., Shipman & Mumford, 2011) have noted that hubris extends beyond overconfidence to "ego", excessive pride, and a generalized sense of exaggerated self-worth. Perhaps most noteworthy is the fact that hubris has been most often discussed within the context of the "dark side" of leader traits (Judge et al., 2009), whereas leader confidence has been positioned as a universally desired positive trait within leadership research (Den Hartog et al., 1999; Hogan et al., 1994; Kirkpatrick & Locke, 1991; Magee & Frasier, 2014). And even when this confidence exceeds competence (i.e., overconfidence), the consequences do not necessarily have to be negative. For example, overconfidence has been related to innovation (Engelen, Neumann, & Schwens, 2015) and greater stock return volatility (Hirshleifer, Low, & Teoh, 2012).

Charismatic leadership, which has been shown to manifest both positive and negative outcomes (Howell & Avolio, 1992), refers to symbolic leader influence rooted in emotional and ideological foundations. Charisma's effects manifest in observer/follower attributions of the leader, which follow from leaders' (trainable) verbal and nonverbal influence tactics (Antonakis et al., 2011, 2016). Perceptions of charisma have also been shown to interact with perceptions of crisis in the prediction of leadership emergence, although in unstable ways (Pillai, 1996; Pillai & Meindl, 1991; Pillai & Meindl, 1998; Williams, Pillai, Deptula, & Lowe, 2012). Although not the focus of the current research, it is possible that overconfident individuals are more likely to appear as charismatic in the eyes of observers. As such, overconfidence might be positioned as a potential antecedent of charisma. Importantly however, we do not believe that overconfidence as we conceptualize it (i.e., as a manifestation of self-deception) can be taught or trained, such that anybody can learn to consciously enact overconfidence displays, as has been demonstrated for charisma by Antonakis et al. (2011).

Bass (1985) argued that charisma, or idealized influence, is a sub-component of the broader construct of transformational leadership. More recently other scholars have suggested the two constructs are related but theoretically distinct (Antonakis et al., 2011; Antonakis, 2012; Yukl, 1999). Antonakis (2011; 2012), for instance, differentiates



transformational leadership on the basis of leader influence grounded in an empowering or developmental focus (e.g., individualized consideration), and a “rational” influencing means (e.g., intellectual stimulation). In any case, there seems to be agreement with regard to both transformational leadership (Bass, 1985; Yukl, 1999) and charismatic leadership (Antonakis et al., 2011) requiring an effect on followers, rather than as constructs that are located within leaders themselves. In contrast, overconfidence is located within the individual, and while we do argue that overconfidence leads to positive attributions from (would be) followers, the (aspiring) leader needs no audience to validate their overconfidence. Overconfidence is an intrapsychic error in judgment, which we argue manifests in positive attributions of leadership potential, but does not require these attributions to validate the construct.

#### Consequences of overconfidence

Selecting overconfident leaders may have detrimental consequences for organizations. Overconfident CEOs might be more likely to overestimate their capabilities, performance, and chances of success, increasing the likelihood of decision-making errors. For instance, Malmendier and Tate's (2008) study of 394 large, publicly traded US firms found that overconfident CEOs were 65% more likely to make value-destroying decisions. Corporate failures, such as Enron, the National Kidney Foundation, Parmalat, Global Crossing, Vivendi Universal, Tyco, and WorldCom, have been anecdotally linked to “managerial hubris” (Hayward, 2007), or overconfidence mixed with excessive pride (Judge et al., 2009). Another study that analyzed data from publicly listed US banks between 1994 and 2009 reported that overconfident CEOs were more likely to decrease lending standards and to increase leverage in advance of a crisis, compared to other CEOs (Ho, Huang, Lin, & Yen, 2016). As a result, these banks experienced more loan defaults, larger drops in stock returns, and poorer operating performance.

Decision making errors due to CEO overconfidence might also extend to the pursuit of riskier strategies that drive up stock return volatility (Hirshleifer et al., 2012). For instance, Galasso and Simcoe (2011) analyzed 290 publicly traded companies and 627 CEOs and found that newly appointed overconfident CEOs were associated with a 25%–35% increase in citation-weighted patent counts. While under the right market conditions this can increase innovation, under the wrong conditions, or when conditions are overoptimistically appraised, it can yield costly mistakes.

Overconfident CEOs are also more likely to ‘stick to their guns’, even when those guns are pointed squarely at their own feet. For instance, Ronay, Oostrom, Lehmann-Willenbrock, and Van Vugt (2017) conducted four studies that demonstrated a positive relationship between overconfidence and escalation of commitment in investment tasks. Relatedly, Schrand and Zechman (2012) examined 49 firms that had been identified by the SEC as having misstated the nature of their accounts. A quarter of these firms were found to have committed outright fraud, but for the remainder, executives' initial misstatements appear to have simply reflected overestimation, which executives then felt compelled to continue misreporting so as to not reveal their initial error.

Despite these scattered accounts of overconfident leaders there remains little work on why leaders might be more likely to be overconfident. Fast, Sivanathan, Mayer, and Galinsky (2012) showed that the power and prestige that come with leadership provide a fertile breeding ground for *developing* overconfidence. However, this evidence and theorizing cannot account for the observed relationship between overconfidence and emergent leadership (Reuben et al., 2012), nor for the findings of Anderson et al. (2012) who report evidence for the status enhancing utility of overconfidence. Thus, we suggest and test an additional selection-based explanation: Overconfidence provides an advantage in leadership selection as it is appraised as accurately calibrated confidence.

#### Overconfidence and judgment accuracy

Brunswik's (1956) lens model offers a conceptual framework for studying predictions of criteria that are probabilistically related to cues (e.g., a recruiter's judgment of job candidates' potential on the basis of their behavior). The accuracy of these predictions depends on two relationships: the correlations between the cues and the underlying construct (i.e., cue validity) and the correlations between the cues and the inferences drawn by the observer (i.e., cue utilization). The accuracy of observers' judgment is a function of the extent to which cues accurately reflect the underlying construct (cue validity), as well as to what extent observers use these cues in their predictions (cue utilization). A main advantage of grounding our work in Brunswik's lens model is its ability to model judgment accuracy by taking into account two processes: the cues that observers use to predict leadership potential, and the relationships between these cues and candidates' overconfidence levels.

Recently, Kausel, Culbertson, and Madrid (2016) investigated the role of overconfidence in personnel selection utilizing the same model. They demonstrated how a combination of standardized tests and unstructured interviews (versus standardized tests alone) led recruiters to be more overconfident (i.e., less accurate) in their predictions of candidates' future job success. Although candidates' overconfidence was not the focus of Kausel et al. (2016), we expect that this unmeasured variable played a role in distorting observers' estimations of candidates' future job success. In the current paper we test such a possibility by zooming out and surveying the relationship between cue utilization and cue validity. Whereas Kausel et al. (2016) positioned the judgment inaccuracy within the selection committee, we suggest a complementary explanation that locates the origin of error within the candidate. We build on previous theorizing by von Hippel and Trivers (2011) who position overconfidence as a form of self-deception and not merely conscious bluff or deceit, which can be observed or detected by others (e.g., Vrij et al., 2000). Rather, we refer to overconfidence as a *self-deceptive belief* that one is more skilled, intelligent, and capable than one actually is (Epley & Whitechurch, 2008; Kruger & Dunning, 1999; von Hippel & Trivers, 2011). This self-deceptive component is consistent with conceptualizations of overconfidence as a “genuinely flawed perception of one's own abilities” (Anderson et al., 2012; von Hippel & Trivers, 2011). Thus, we theorize that due to a failure of self-insight, overconfident candidates operate under the fulsome belief that they are at least a little better than they actually are, resulting in falsely inflated signals of their actual competence. This error of self-insight leads observers to incorrectly infer a higher level of leadership potential than is warranted. Fig. 1 shows the hypothesized false behavioral signals of overconfident candidates leading to lower cue validity and therefore judgment inaccuracy.

**Hypothesis 1.** Candidates' overconfidence is positively associated with perceptions of leadership potential.

Importantly, whereas perceptions of confidence are generally well received, perceptions of overconfidence have been shown to meet with disapproval (e.g., Colvin et al., 1995; Jones & Shrauger, 1970; Schlenker & Leary, 1982; Tenney et al., 2008). However, as our model locates the calibration error within the overconfident candidate, who is by our reasoning unaware that their self-opinions are inflated, they do not appear overconfident but merely confident, and so draw no such disapproval. Thus, we expect that observers are unable to distinguish the behavioral signals associated with overconfidence from behavioral signals associated with confidence matched to competence.

**Hypothesis 2.** Candidates' overconfidence is positively associated with perceptions of confidence and competence.

By presenting falsely inflated behavioral signals, the cue validities for overconfident candidates are attenuated if not reversed (Fig. 1). Thus, judgment accuracy is low, not because observers utilize the wrong cues in their assessment of leadership potential, but because

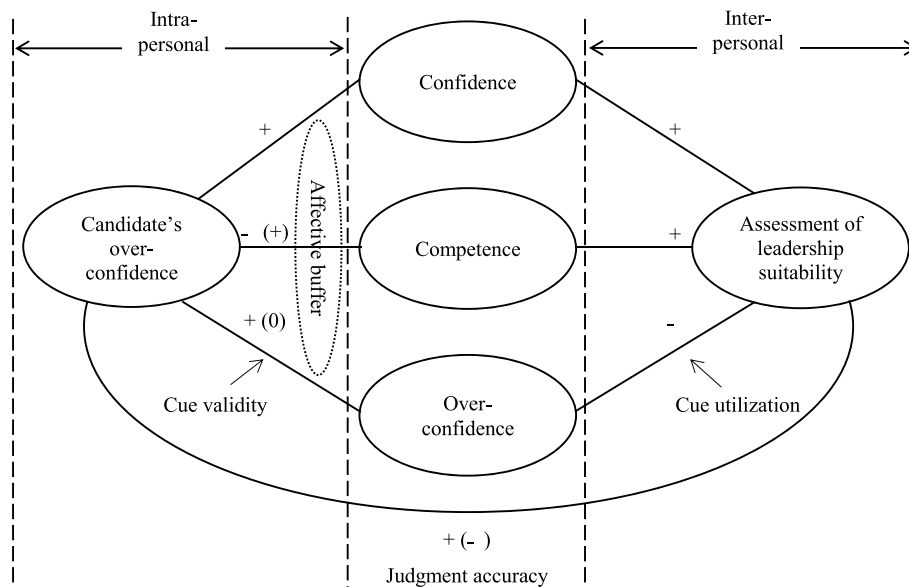


Fig. 1. Graphical representation of Brunswik's (1956) lens model applied to leadership selection contexts. Between parentheses are the hypothesized false behavioral signals of overconfident candidates leading to lower cue validity and therefore judgment inaccuracy.

overconfidence signals desired leader traits (i.e., high confidence and high competence), where it should signal *overconfidence* and low competence. Indeed, Anderson et al. (2012) demonstrated that, in the absence of information to the contrary, observers assume overconfidence to reflect superior competence.

**Hypothesis 3.** Perceptions of confidence and competence mediate the relationship between candidates' overconfidence and perceptions of leadership potential.

#### Explanatory mechanisms

Explanations for the positive effects of overconfidence have focused almost exclusively on *intrapersonal* hedonic benefits such as higher self-esteem. Overly positive beliefs about oneself have been proposed to act as an intrapsychic buffer against threats to self-esteem, serving to sustain optimism, bolster happiness, enhance creativity, and drive goal pursuit (e.g., Dunning et al., 1995; Taylor & Brown, 1988). These early accounts and the empirical work that accompanied them clearly demonstrated that in general people are motivated toward overconfidence and other self-serving illusions, such as optimism and illusions of control. However, whereas these accounts also positioned these self-enhancing illusions as arising from the need to maintain and/or maximize self-esteem, recent work has raised the possibility that self-enhancing illusions such as overconfidence may serve an *interpersonal* function, by promoting behavioral signals that are read by others as confidence that is backed by competence (Anderson et al., 2012; Murphy et al., 2015; von Hippel & Trivers, 2011). Accordingly, overconfidence might provide social and professional benefits. We believe these social benefits might be especially pronounced in the context of leadership selection.

What has not yet been explored is the possibility that these *intra-* and *interpersonal* effects might be meaningfully related to one another. Indeed, the intrapsychic benefits of overconfidence such as higher self-esteem, positive affect in the face of social stressors, and a fulsome belief in one's general prowess may facilitate the display of behavioral signals that lead the overconfident to appear more confident and in charge of their situations and circumstances. Leadership competitions are psychologically stressful contexts, and while such stress can enhance performance up to a point, beyond this point people's performance begins to suffer (Yerkes & Dodson, 1908). For this reason, overestimation of one's skills and abilities in response to the social evaluative stressors of selection settings may serve to attenuate

distracting shifts in affect that may otherwise arise from self-doubt (Hope, Gansler, & Heimberg, 1989; Rapee & Lim, 1992). Grounding our theory within Brunswik's (1956) lens model, we describe the relationship between the intrapersonal versus interpersonal utilities of overconfidence by examining the mediating role of affective robustness in the relationship between candidates' overconfidence and observers' competence perceptions.

We define affective robustness as an individual difference that makes some individuals less susceptible to affective changes in response to stressful circumstances. The concept is similar to that of "resilience" which appears more frequently in the literature (for a review see Kaplan, 2002) but we reasoned that resilience (1) implies "bouncing back" from stress rather than being less susceptible to stressors in the first instance, and (2) resilience is confounded by conceptualizations that define it as an outcome versus a cause or influence in the stress/response relationship. We see affective robustness as an individually located cause or influence that makes some individuals less susceptible to affective stressors. As such, affective robustness is also akin to the personality construct of "hardiness" (Kobasa, 1979), which comprises three adaptive characteristics: commitment (belief in the importance and value of oneself), control (the belief that life events are the consequences of one's actions), and challenge (the belief that change is positive rather than threatening). Despite the conceptual overlap, hardiness is commonly measured through a single administration of a trait-based questionnaire (e.g., Bartone, 2007), while affective robustness is operationalized by a (lack of) change in affective states measured before and after a stressful event. We are interested in such changes in affective states, as we believe that the overconfident are relatively unaffected by stressors, which provides them an advantage in the context of leadership selection.

**Hypothesis 4.** The positive relationship between overconfidence and competence perceptions is mediated by affective robustness in response to social stress.

#### The present research

We tested our predictions in five studies using a multi-method approach to triangulate on our central question: Are individual differences in candidates' overconfidence predictive of leadership selection? We address this question with a diverse range of data sources –

organizational field, cross sectional political, experimental, laboratory, and via an agent-based model. Study 1 was a field study wherein leadership aspirants completed a measure of overconfidence before being assessed by HR consultants for an advertised leadership position. Study 2 was a laboratory study that isolated the intra- and interpersonal utilities of overconfidence, allowing us to test our hypothesized interplay between them. Study 3 was an experiment in which we tested the effect of confident behavioral signaling on leadership selection at different levels of manipulated competence. Study 4 – a cross sectional study run in the context of the 2016 US Primaries – examined the relationship between respondents' voting intentions and their perceptions of candidates' confidence and competence. Finally, to illustrate possible societal effects of selection processes biased in favor of overconfident leaders, Study 5 uses an agent-based simulation. It examines the longer-term consequences of voters' preferences as in early 2016 (i.e., as observed in Study 4) on presidential candidates' confidence signaling strategies and the resulting election outcomes.

To measure overconfidence we employed an item-confidence paradigm (Michailova, 2010) to target overprecision. Overprecision is not only the most reliable way of operationalizing overconfidence (Moore & Healy, 2008; Moore & Schatz, 2017; Moore & Swift, 2010) but has also shown to be especially pervasive and resistant to debiasing efforts (Harvey, 1997; Soll & Klayman, 2004). The paradigm asks a series of general knowledge questions and for each provides three response options from which participants can select the correct answer. Participants are asked to indicate their confidence in the correctness of their chosen response. Overconfidence is then derived from the degree to which their confidence exceeds the accuracy of their responses. According to Michailova and Katter (2014), this instrument captures overconfidence in its original psychological sense of miscalibration, which mirrors the concept of overprecision as described by Moore and Healy (2008). Therefore, throughout the current research we operationalize overconfidence as the difference between individuals' confidence in their own knowledge and an objective measure of their actual knowledge.

### Study 1

The goal of Study 1 was to test our core prediction – the positive relationship between overconfidence and perceived leadership potential – in a field setting where the external validity of our findings would be clearest. This context provided a strong test of our core hypothesis, as both the consultants' appraisals and the candidates' performance carried tangible potential costs and benefits.

### Method

Participants were 76 assessment center candidates (44 male,  $M_{age} = 35.53$ ,  $SD = 7.90$ ), who had applied for a leadership position and were assessed by a large HR-consultancy in the Netherlands. This was the complete sample of candidates who were interviewed for this position during the 6 months of data collection. The majority of participants were born in the Netherlands (57%) or Belgium (8%), and 51% held a leadership position at the time of the assessment. The assessment center program varied per participant, but all programs contained a role-play, one or two interviews, a personality questionnaire, and a cognitive ability test. Each participant was assessed by one consultant ( $N = 12$  in total; 3 male), who conducted the interview(s), and scored the participant on the assessment center dimensions at the end of the assessment day.

Study participation was voluntary. At the end of the assessment day, but before the feedback session in which the consultant discussed his/her observations with the participant, the consultant asked whether the participant would be willing to fill out a general knowledge questionnaire (GKQ) for research purposes. The consultant stressed that results would be treated confidentially, that he/she would not see the test results, and that neither study participation nor the test results

would influence the assessment center outcome. After the feedback session, the consultant filled out a short questionnaire to assess their own estimation of the applicants' overconfidence. The competency scores (i.e., scores on the assessment center dimensions) were retrieved from the HR-consultancy's database after data collection was complete.

Overconfidence was operationalized as overprecision, or excessive certainty in the correctness of one's knowledge (Moore & Healy, 2008; Moore & Schatz, 2017; Moore & Swift, 2010) on an existing General Knowledge Questionnaire (GKQ; Michailova, 2010). Previous research has traditionally used confidence intervals to measure overprecision, but this procedure has been shown problematic for two main reasons. First, they require understanding of statistical notions with which even well-educated people regularly make large errors (Cosmides & Tooby, 1996); and second, it consistently produces extreme overconfidence levels (cf. Klayman, Soll, Gonzalez-Vallejo, & Barlas, 1999; Winman, Hansson, & Juslin, 2004). The General Knowledge Questionnaire overcomes these problems as the task is clearer to subjects, better resembles how people experience and express confidence in daily life, and is not inherently prone to elicit extreme levels of overconfidence (Klayman et al., 1999; Michailova & Katter, 2014).

We used a previously adapted version (Ronay et al., 2017) of the GKQ (Michailova, 2010; Michailova & Katter, 2014), taking the 18 items from Michailova's (2010) original measure (e.g., *How many days does a hen need to incubate an egg?*) and adding six further items (Ronay et al., 2017). Participants were instructed to choose the correct answer from three alternatives (e.g., *21 days, 28 days, 14 days*) and to provide a number between 33% (chance) and 100% (absolute certainty) indicating their confidence in the accuracy of that answer.<sup>1</sup> Consistent with previous work and as many scholars recommend,<sup>2</sup> we computed overconfidence by regressing participants' confidence scores (i.e., mean confidence ratings) onto their accuracy (i.e., percentage of correctly answered items) and saving the standardized residual scores (Anderson et al., 2012; Cohen et al., 2003; Cronbach & Furby, 1970; DuBois, 1957; John & Robins, 1994).<sup>3</sup> This approach isolates the variance in participants' confidence while controlling for variance in accuracy (i.e., confidence over and above accuracy) and correlates at 0.97 with a difference score (i.e., mean  $M_{\text{confidence}} - M_{\text{accuracy}}$ ).

Consultants' perceptions of applicants' overconfidence were measured subjectively by asking the consultants to rate the participants on five items specifically developed for this study (e.g., *During the*

<sup>1</sup> To confirm that the GKQ indeed measures self-deceptive beliefs, we tested among a sample of 127 students whether participants are capable of accurately calibrating their confidence to their actual level of competence when incentivized to do so. To this end, we financially incentivized half of our participants to accurately match their confidence estimations to their actual performance, and we compared their overconfidence scores to a control group who had received no financial incentive. If participants are self-deceptively unaware of their overconfidence, they should be unable to accurately adjust their confidence levels even when motivated to do so. Indeed, we found no difference in overconfidence between the two groups,  $F(1,125) = 1.56$ ,  $p = .21$ . These results are consistent with previous findings (Ehrlinger, Johnson, Banner, Dunning, & Kruger, 2008; Hoelzl & Rustichini, 2005; Williams & Gilovich, 2008).

<sup>2</sup> The use of difference scores has received widespread criticism as difference scores are unreliable and tend to be confounded with variables that constitute the index (e.g., Cohen, Cohen, West, & Aiken, 2003; Cronbach & Furby, 1970). Scholars have suggested regressing participants' actual performance onto their self-evaluations and retaining the residuals of the self-evaluations (e.g., John & Robins, 1994).

<sup>3</sup> Since it has been found that overconfidence is most evident in general knowledge items of moderate or extreme difficulty (Lichtenstein, Fischhoff, & Phillips, 1982; Michailova, 2010; Moore & Healy, 2008), we calculated the correlations between the mean score of the standardized residuals of items of low (51–100% accuracy) and high difficulty (0–51% accuracy). The two scores correlated 0.65, indicating that both type of items are measuring the same construct.

**Table 1**

Means, standard deviations, and intercorrelations for Study 1.

	N	M	SD	1	2	3	4	5	6	7	8	9	10	11	12	13	314
1. Age	76	35.55	8.30														
2. Gender	75	0.61	0.49	0.22													
3. Nationality	76	0.43	0.50	−0.47**	−0.43**												
4. Leadership position	76	0.51	0.50	0.05	−0.03	−0.16											
5. Overconfidence (GKQ)	76	0.00	0.99	0.05	−0.10	0.07	0.13										
6. Subjective overconfidence	76	2.93	1.03	0.00	−0.04	−0.21	0.19	−0.03									
7. Leading & deciding	57	57.29	12.81	0.17	−0.05	0.10	0.14	0.27*	0.08								
8. Supporting & cooperating	44	57.86	18.63	−0.17	−0.04	0.05	−0.06	−0.10	−0.21	−0.32							
9. Interacting & presenting	42	54.83	17.92	0.02	0.06	−0.19	−0.38*	0.07	−0.31*	−0.13	0.32						
10. Analyzing & interpreting	22	73.08	22.94	−0.17	0.38	0.00	0.11	−0.05	−0.37	−0.24	0.08	0.26					
11. Creating & conceptualizing	17	66.39	22.87	−0.36	−0.39	0.39	0.21	0.31	−0.15	0.08	−0.16	0.11	− <sup>a</sup>				
12. Organizing & executing	44	68.85	17.65	−0.26	0.06	0.22	−0.18	−0.33*	−0.15	−0.12	0.06	−0.01	0.05	− <sup>a</sup>			
13. Adapting & coping	43	68.32	19.12	−0.06	−0.22	−0.08	0.40**	0.34*	0.00	0.29	0.54**	0.33	−0.63	0.72**	−0.09		
14. Enterprising & performing	49	70.45	16.94	−0.21	0.00	0.20	−0.14	0.11	−0.16	0.31	0.41*	0.32	0.07	0.41	0.19	0.49*	
15. Average competency score	71	64.27	9.67	−0.16	−0.03	0.21	−0.18	0.05	−0.28*	0.29*	0.57**	0.61**	0.49*	0.72**	0.45**	0.53**	0.70**

Note. Gender was coded as 0 = female and 1 = male. Nationality is coded as 0 = Dutch and 1 = other. Leadership position is coded as 0 = no and 1 = yes. Overconfidence is represented by the standardized residual score after regressing confidence scores onto their accuracy on the General Knowledge Questionnaire (GKQ). Subjective overconfidence was measured on a 5-point scale and the competencies were measured on a scale from 0 to 100.

<sup>a</sup> None of the participants were rated on both of these competencies.

\*  $p < .05$ .

\*\*  $p < .01$ .

interview it became clear that the participant overestimates his/her job performance.”). The consultants rated participants' overconfidence on a 5-point scale, with 1 = *strongly disagree* and 5 = *strongly agree*. Coefficient alpha of this scale was 0.92.

The recruitment agency had an established evaluation procedure in which the consultants independently decided which assessment center dimensions to use from a database of 104 different dimensions. To distill this granular data into a more structured analytic framework, we made an *a priori* decision to organize the consultants' competency ratings around Bartram's (2005) Great Eight competency framework. The Great Eight consists of the following competencies: *Leading and Deciding*, *Supporting and Cooperation*, *Interacting and Presenting*, *Analyzing and Interpreting*, *Creating and Conceptualizing*, *Organizing and Executing*, *Adapting and Coping*, and *Enterprising and Performing*. Prior to data gathering and analysis, each assessment center dimension was independently coded by three authors of this paper as well as two research assistants. Each coder ascribed one of the Great Eight competencies to each of the assessment center dimensions. If three or more coders agreed, the assessment center dimension was classified accordingly (ICC[3,1] for absolute agreement = 0.89). We were able to categorize 85% of the dimensions used by the consulting firm according to the Great Eight competency scheme.

## Results

Table 1 presents the means, standard deviations, and correlations for the demographical variables, the two overconfidence measures, and the Great Eight competencies.<sup>4</sup> Consistent with Hypothesis 1 – candidates' overconfidence will be positively associated with perceptions of leadership potential – candidates' overconfidence (GKQ) was positively

<sup>4</sup> We did not control for any of the demographics in our analyses. Age, gender, and nationality were not significantly correlated with our study variables. Leadership position correlated with *Interacting and Presenting* ( $r = -0.38$ ,  $p = .01$ ) and *Adapting and Coping* ( $r = 0.40$ ,  $p = .01$ ). Controlling for leadership position would not change our conclusions; only the correlation between the GKQ and *Adapting and Coping* would become marginally significant ( $r = 0.30$ ,  $p = .06$ ).

related to evaluations on the dimension of *Leading and Deciding* ( $r = 0.35$ ,  $p < .01$ ). Candidates' overconfidence (GKQ) was also positively related to *Adapting and Coping* ( $r = 0.47$ ,  $p < .01$ ).

Overconfidence as measured by the GKQ was unrelated to overconfidence as assessed by the consultants ( $r = -0.03$ ,  $p = .81$ ). In other words, there was no relationship between the consultants' perceptions of how overconfident candidates were, and candidates' actual levels of overconfidence. Of those job candidates who were classified as overconfident based on their GKQ scores ( $n = 58$ ), the consultants correctly identified less than half ( $n = 23$ , 40%) as being overconfident (i.e., rated the overconfidence > 3). Of those job candidates who were classified as underconfident based on their GKQ scores ( $n = 18$ ), the consultants believed more than half ( $n = 10$ , 56%) to be overconfident. In contrast to candidates' actual overconfidence, consultants' perceptions of candidates' overconfidence were negatively correlated with their average competency score ( $r = -0.28$ ,  $p = .02$ ).

## Discussion

The results of Study 1 provide preliminary support for our central Hypothesis 1. In contrast and consistent with previous reports (Schlenker & Leary, 1982; Tenney et al., 2008), when overconfidence was *incorrectly* inferred by consultants, it resulted in disapproval and low assessment center ratings. Consistent with our conjectures, candidates' overconfidence was unrelated to consultants' *perceptions* of candidates' overconfidence. These findings strongly support the view that overconfidence is effective as a status-enhancing mechanism because it appears indistinguishable from confidence (von Hippel & Trivers, 2011), apparently even to professional recruitment consultants. The same cannot be said for observer attributions of overconfidence, as these were negatively related to performance evaluations. Exactly what cues were being used when consultants incorrectly inferred overconfidence is not clear but distinguishing these from behavioral cues associated with candidates' overconfidence is an important and interesting avenue for future research. At a practical level, our results reveal that consultants should be very careful in forming subjective evaluations of participants' overconfidence. As these perceptions are *un*-correlated with candidates' actual overconfidence levels, they may have



**Table 2**  
Means, standard deviations, and intercorrelations for Study 2.

	<i>M</i>	<i>SD</i>	1	2	3	4	5	6	7	8	9	10	11	12
1. Overconfidence	0.00	1.00												
2. Eye contact <sup>NV</sup>	4.04	0.84	0.18*											
3. Posture <sup>NV</sup>	3.57	0.75	0.06	0.23**										
4. Gestures <sup>NV</sup>	3.18	1.07	0.17*	0.33**	0.68**									
5. Use of space <sup>NV</sup>	2.80	0.61	0.21*	0.21*	0.54**	0.67**								
6. Calmness <sup>NV</sup>	3.18	0.77	0.08	0.41**	0.41**	0.46**	0.34**							
7. Structure	3.54	0.81	0.04	0.31**	0.34**	0.43**	0.30**	0.53**						
8. Speech	3.77	0.71	0.04	0.45**	0.32**	0.37**	0.27**	0.63**	0.62**					
9. Understandability	3.99	0.52	0.03	0.40**	0.26**	0.28**	0.17*	0.47**	0.57**	0.64**				
10. Main points	3.59	0.62	0.02	0.14	0.31**	0.35**	0.23**	0.30**	0.61**	0.38**	0.46**			
11. Enthusiasm <sup>NV</sup>	3.26	0.89	0.14	0.22**	0.60**	0.70**	0.63**	0.47**	0.50**	0.44**	0.29**	0.30**		
12. Voice	3.93	0.48	-0.05	0.26**	0.17*	0.14	0.13	0.52**	0.30**	0.52**	0.45**	0.21*	0.22*	
13. Persuasion	3.30	0.96	0.08	0.34**	0.45**	0.58**	0.46**	0.64	0.78**	0.65**	0.59**	0.65**	0.62**	0.37**

Note. Overconfidence is represented by the standardized residual score after regressing confidence scores onto accuracy on the General Knowledge Questionnaire (GKQ). The AC criteria are all measured on a 5-point scale. *N* = 140.

<sup>NV</sup> = Nonverbal dimensions.

\* *p* < .05.

\*\* *p* < .01.

detrimental effects on the validity and the utility of the assessment center.

## Study 2

The goal of Study 2 was to directly test the mechanisms identified in our model (Fig. 1) and summarized in Hypothesis 4 – the positive relationship between overconfidence and competence perceptions is mediated by affective robustness in response to social stress. We expected that any such affective advantage would manifest most strongly via non-verbal channels, as these channels are acutely sensitive to stress (Makatsori et al., 2004) and the most difficult to intentionally conceal from attentive observers (Ekman & Friesen, 1969, 1974).

Our second question concerned the extent to which overconfidence as measured by the GKQ generalizes to overconfidence in one's social prowess and presentation skills within the context of leadership contexts. If one's inflated self-image is domain specific, in this case limited to knowledge of obscure facts, then it should have little bearing on how confident people appear when competing for leadership roles. On the other hand, if such overconfidence is domain-independent and reflects a generally enhanced self-image, then this might lead one to appear more confident, and therefore competent in the eyes of a leadership selection panel. To determine whether overconfidence in one's own general knowledge generalizes to our context of interest, we asked participants to rate the quality of their own presentations on the same assessment center criteria addressed by the panel, and we compared these to GKQ scores as well as a panel's ratings.

## Method

Participants were 140 students (23 male; *M*<sub>age</sub> = 20.02, *SD* = 1.89) at a large Dutch university who were asked to deliver a simulated job talk in front of a live committee, a reliable inducer of stress (Kirschbaum, Pirke, & Hellhammer, 1993). To provide a baseline for affect, participants first completed the Positive and Negative Affect Scale (PANAS; Watson, Clark, & Tellegen, 1988), prior to learning they would have to deliver a job talk. We again used the GKQ to assess overconfidence. Participants were then given 10 min to prepare a 5 min presentation, intended to convince a committee (consisting of two trained research assistants who were blind to our hypotheses) that they were the best candidate for a hypothetical leadership position. Presentations were video recorded and rated by the panel in terms of their verbal and non-verbal quality. To assess change in affect in response to the social stressor, participants again completed the PANAS (a frequently used measure of mood stability/change in the context of social

evaluative stressors; for a review see Allen, Kennedy, Cryan, Dinan, & Clarke, 2014) immediately following the presentation. Finally, participants were asked to evaluate the quality of their own presentations on the same criteria used by the panel.

Overconfidence was measured using the same questionnaire, confidence estimations, and residualized approach as in Study 1. We used the PANAS (Watson et al., 1988), which consists of 10 positive ( $\alpha = 0.82$  at T0 and  $\alpha = 0.87$  at T1) and 10 negative ( $\alpha = 0.86$  at T0 and T1) emotion terms on which participants indicate their present affective experience on a 5-point scale anchored by 1 = *very slightly* or *not at all* and 5 = *extremely*.

Presentations were evaluated according to 12 criteria ( $\alpha = 0.90$  for other ratings and  $\alpha = 0.91$  for self-ratings), of which 6 related to the verbal quality of the presentation (structure, speech, understandability, main points, voice, and persuasion;  $\alpha = 0.87$  for other-ratings;  $\alpha = 0.86$  for self-ratings) and 6 to the non-verbal quality of the presentation (eye contact, posture, gestures, use of space, calm, and enthusiasm;  $\alpha = 0.83$  for both other-ratings and self-ratings). The participants and the two observers rated the criteria on a 5-point scale, with 1 = *weak performance* and 5 = *strong performance*. Observer ratings were averaged for each dimension; the average ICC (Hollander, 1958) for consistency was 0.74. The average correlation between the self-ratings and the other ratings was 0.22.

## Results

Table 2 provides the bivariate correlations between overconfidence and the six verbal and six nonverbal criteria. Regressing the overall score (mean of all 12 criteria) onto overconfidence revealed no relationship,  $b = 0.07$ , 95%CI[−0.02, 0.16],  $t(138) = 1.52$ ,  $p = .13$ ,  $d = 0.26$ . When we independently regressed our verbal and non-verbal composite variables onto overconfidence, we observed no relationship with verbal quality,  $b = 0.02$ , 95%CI[−0.07, 0.11],  $t(138) = 0.44$ ,  $p = .66$ ,  $d = 0.07$ , and as expected, we observed a positive relationship with the non-verbal quality of the presentations,  $b = 0.12$ , 95%CI[0.01, 0.22],  $t(138) = 2.22$ ,  $p = .03$ ,  $d = 0.38$ .

Participants experienced significant decreases in positive affect,  $M = 3.09$ , *SD* = 0.57 at T0 and  $M = 2.83$ , *SD* = 0.73 at T1,  $F(1,139) = 30.61$ ,  $p < .01$ ,  $d = 0.94$ , and significant increases in negative affect,  $M = 1.36$ , *SD* = 0.46 at T0 and  $M = 1.50$ , *SD* = 0.53 at T1,  $F(1,139) = 10.22$ ,  $p < .01$ ,  $d = 0.54$ , following their presentations. We then regressed positive affect measured after the presentation onto overconfidence while controlling for positive affect measured before the presentation and both time-point measures of negative affect. This revealed a positive relationship between overconfidence and change in

positive affect,  $b = 0.09$ , 95%CI[0.00, 0.18],  $t(135) = 2.00$ ,  $p = .05$ ,  $d = 0.34$ ,  $d = 0.31$ . Note that this result reveals that whereas we observed a main effect for a decline in positive affect, overconfident participants were more likely to maintain their initial level of positivity in the face of the social stressor. When we employed the same strategy for T1 negative affect, no relationship with overconfidence emerged,  $b = 0.04$ , 95%CI[−0.04, 0.12],  $t(135) = 0.90$ ,  $p = .37$ ,  $d = 0.15$ .

We next turned to [Hypothesis 4](#) – the positive relationship between overconfidence and competence perceptions is mediated by affective robustness in response to social stress. We used Model 4 of the PROCESS Macro ([Hayes, 2016](#)) and entered non-verbal quality as the dependent variable, overconfidence as the independent variable, positive affect at T1 as the mediator. Positive and negative affect at T0 as well as T1 negative affect and verbal presentation quality were entered as covariates. Consistent with our hypothesis, this bootstrapping procedure with 10,000 resamples revealed an indirect effect (IE) via T1 positive affect IE = 0.02, SE = 0.01, 95%CI = [0.00, 0.06]. However, this result should be interpreted with caution as it is likely to be biased by endogeneity.

We conducted a robustness check to examine whether endogeneity issues might be biasing our results, because our mediator (T1 positive affect) and dependent variable (non-verbal presentation quality) may share unmodeled common causes. To that end, we estimated an instrumental variable model using a two-stage least squares estimator ([Shaver, 2005](#); see also [Antonakis, Bendahan, Jacquart, & Lalive, 2010](#)). Specifically, we used the “ivregress” command in STATA/IC 15.1 for Mac (with the “2sls” estimator) with non-verbal presentation quality as the dependent variable, T1 positive affect as an endogenous mediator, individual differences in overconfidence as our exogenous instrument, and verbal presentation quality, T0 positive affect, as well as T0 negative affect and T1 negative affect as control variables. Overconfidence scores serve as an appropriate exogenous instrument because the scores are probably fixed and unlikely to be a function of the other predictors in the model (i.e., a predetermined preference of the subject). This revealed a marginal effect for our instrumented mediator positive affect,  $b = 1.09$ ,  $p = .06$ . However, the first stage of the 2SLS procedure, in which T1 positive affect was regressed onto the exogenous instrument returned an  $F$ -statistic of 3.85,  $p = .05$ . This value is very low (lower than critical values indicating about 30% of bias) and thus indicates our available instrument is very weak. Also, we tested for the exogeneity of our mediator. Results for the Durbin test ( $\chi^2(1) = 3.91$ ,  $p = .05$ ) and Wu-Hausman test ( $F(1,133) = 3.82$ ,  $p = .05$ ) along with our weak instruments clearly indicate that our mediator is endogenous. With such a weak instrument the Hausman test will be rather underpowered even invalid ([Hahn, Ham, & Moon, 2011](#)). This problem is exacerbated by a very small sample size ([Hausman, Stock & Yogo, 2005](#)). As a result of this procedure, and because the OLS and instrumental variable (IV) results are quite different, one must be very cautious in interpreting our PROCESS mediation results.

Given that the instrument is weak, we decided to employ a maximum likelihood approach, which is better suited for, and more efficient with weak instruments. We estimated a SEM model with correlated disturbances for both endogenous variables (i.e., positive affect and non-verbal quality). This specification revealed again a marginal effect of positive affect on nonverbal presentation quality  $b = 1.09$ ,  $p = .06$ , and a small but significant effect of overconfidence on positive affect,  $b = 0.09$ ,  $p = .05$ . The instrumented indirect effect was significant, IE = 0.10,  $p = .01$ , lending support for our [Hypothesis 4](#). Note that given our model was just-identified (i.e., we had one excluded instrument for endogenous predictor), we were not able to test for the validity of the constraint made, that is, whether overconfidence scores only affected non-verbal presentation quality through its effect on positive affect (i.e., the exclusion restriction). Theoretically, nonetheless, we suggest that the effect of overconfidence on non-verbal presentation quality emerges solely as a function of affective robustness in the context of social stress, as overly positive beliefs about oneself have

been described as providing intrapsychic buffer against threats to self-esteem, which are characteristically induced by social stress (e.g., [Dunning et al., 1995](#); [Taylor & Brown, 1988](#)).

Regressing overall self-evaluation of presentation quality onto GKQ scores also revealed a significant positive relationship,  $b = 0.19$ , 95%CI [0.07, .31],  $t(138) = 3.12$ ,  $p < .01$ ,  $d = 0.53$ , and this relationship remained significant when we controlled for panel evaluations,  $b = 0.12$ , 95%CI[0.04, 0.21],  $t(137) = 2.83$ ,  $p < .01$ ,  $d = 0.48$ . Contrasting participants' mean self-evaluations ( $M = 2.69$ ,  $SD = 0.72$ ) with the panel's evaluation ( $M = 3.51$ ,  $SD = 0.53$ ) revealed participants to be far harsher critics of their own performance than were the panel members,  $F(1,139) = 347.03$ ,  $p < .001$ ,  $d = 1.30$ . Consistent with expectations, entering GKQ scores as a covariate in this analysis revealed an interaction,  $F(1,138) = 7.44$ ,  $p < .01$ ,  $d = 0.46$ , such that overconfidence was associated with less self-criticism, correlating at  $r = 0.23$ ,  $p = .007$  with the difference between self and panel evaluations (i.e., self-ratings – panel ratings).

We next looked at the self-rated subcategories for the verbal and non-verbal quality of presentations. GKQ scores positively predicted self-evaluations of verbal presentation quality,  $b = 0.20$ , 95%CI[0.07, 0.32],  $t(138) = 3.15$ ,  $p < .01$ ,  $d = 0.54$ , remaining significant when we controlled for the panel's evaluations,  $b = 0.18$ , 95%CI[0.08, 0.29],  $t(137) = 3.49$ ,  $p < .01$ ,  $d = 0.60$ . GKQ scores also predicted non-verbal presentation quality,  $b = 0.17$ , 95%CI[0.05, 0.30],  $t(138) = 2.76$ ,  $p < .01$ ,  $d = 0.47$ , although this effect was no longer significant after controlling for panel evaluations,  $b = 0.08$ , 95%CI [−0.02, 0.17],  $t(137) = 1.66$ ,  $p = .10$ ,  $d = 0.28$ . We also observed greater variance between self/other ratings on the verbal dimension ( $M = -1.06$ ,  $SD = 0.65$ ) than the non-verbal dimension ( $M = -0.59$ ,  $SD = 0.56$ ),  $t(139) = -9.31$ ,  $p < .001$ , leaving less variance to be explained on the non-verbal dimension.

## Discussion

Consistent with [Hypothesis 4](#), people's psychological experience of social stress was buffered by higher levels of overconfidence and this psychological buffering mediated the positive relationship between overconfidence and the panel's appraisals of participants' competence. This pattern of relationships supports our conceptual model ([Fig. 1](#)) and demonstrates the functional relationship between the intra- and inter-personal effects of overconfidence. However, we acknowledge that the results of our OLS analysis cannot be trusted, given that the regressor is endogenous. Further, the weakness of our available instrument makes our IV approach less than ideal (albeit better than OLS). Future replications using stronger instruments and experimental designs may help rule out endogeneity concerns.

Our second question concerned the extent to which overconfidence in one's general knowledge (i.e., GKQ scores) would generalize to overconfidence in one's social prowess and presentation skills. We saw a consistent and positive relationship between overconfidence as measured by the GKQ and people's self-evaluations. Importantly, these effects held when we controlled for the panel's evaluations, with the exception of the non-verbal evaluations, where reduced variance between self and other ratings may have limited our power to detect the effect. It is of interest, however, that participants in this study generally underestimated the quality of their presentations relative to the panel's ratings. This finding was in contrast to their overestimation of accuracy on the GKQ. Although the *relative* degree to which participants self-enhanced remained more or less consistent, the *absolute* degree to which they self-enhanced was lowered when they were under the scrutiny of a selection panel. In other words, participants, in general, underestimated the quality of their presentations compared to the panel ratings of their presentations, however, this generalized underestimation was attenuated by individual differences in overconfidence, as measured by the GKQ. We suggest that this generalized underestimation was due to the public versus private contexts in which these self-assessments were made. If overconfidence is socially motivated and

functional, as we suggest it is, and if inferred overconfidence results in negative social outcomes, then the *expression* of overconfidence should be sensitive to social scrutiny. This reasoning is consistent with both laboratory findings (e.g., Hughes & Beer, 2012; Ronay et al., 2017), and observed cultural differences in the *expression* of self-enhancement (Yates, Lee, & Bush, 1997), which emerge despite the cross-cultural consistency of self-enhancing cognitions (Sedikides, Gaertner, & Toguchi, 2003). See also Brown (2010), Sedikides and Alicke (2012), and Sedikides and Gregg (2008) for a discussion regarding the universality of self-enhancement.

It is worth noting that the calibration of overconfidence in the context of social evaluative scrutiny sparks deeper questions regarding the level at which people might be engaging in self-deception. If people's overconfidence stems from self-deception, as we argue it must do in order to be interpersonally effective, then how are expressions of overconfidence sensitive to social scrutiny? Readers interested in exploring this profoundly fundamental question should perhaps start with von Hippel and Trivers' (2011) original article before moving on to the commentaries and responses that accompanied that publication. In particular, Lu and Chang (2011) describe how the interpersonal 'arms race' between deception and deception detection necessitates that self-deception must respond to social conditions registering detection-varying problems. von Hippel and Trivers (2011) also dedicate a large section of their response to describing "plausibility constraints" and mechanisms that are necessary for self-deception to effectively facilitate what they argue is its ultimate goal of other-deception. They highlight that the calibration of self-deception, in the service of plausibility, need not be operating at a consciously accessible level, "we certainly believe that self-deception is intentional, in the sense that the organism itself intends to produce the bias, although the intention could be entirely unconscious" (von Hippel & Trivers, 2011, p. 42).

A limitation of Study 2 is that the panel could only indirectly infer competence from targets' behavioral displays during the job talk, whereas in actual selection contexts, assessors have additional objective cues of competence. A resume, which provides a clear indication of the applicant's competence through past accomplishments, is part of nearly every selection procedure (Zibarras & Woods, 2010). With competence known, it is presumably easier to distinguish between confidence and overconfidence, and so behavioral displays of confidence might be less effective and more likely to draw censure when one's self-aggrandizing bluff and bluster is accompanied by contrary evidence. On the other hand, strong signals of confidence may always be seen as potential, winning status and leadership support even when recognized as overconfidence (Kennedy et al., 2013). We will therefore test whether the positive effects of overconfidence in leadership selection will remain when assessors possess clear information regarding the candidates' competence.

### Study 3

In Study 3 we employed an experimental design that would allow us to simultaneously address Hypotheses 1–3. Our key question concerned whether candidates' overconfidence would be positively associated with perceptions of leadership potential even when candidates' competence is known to be low. As per Hypothesis 2, we also expected that observers would read the behavioral signals associated with candidates' overconfidence as denoting confidence and competence, but not overconfidence. And as per Hypotheses 1 and 3, we expected that these perceptions of confidence and competence would mediate the positive relationship between overconfidence and leadership potential.

To test our hypotheses, we took the first thirty second slice of each of the videos recorded in Study 2, we removed the audio, and we paired each video with cues of both high and low competence (manipulated by an accompanying resume). We saw this as a strong test of the strength of (over)confident signaling – we ask people to infer leadership suitability from half a minute of silent behavior and we expected these assessments to be predicted by targets' overconfidence on a general

knowledge test. Previous studies have indeed shown that such thin slices of behavior provide accurate assessments of a wide variety of traits (Ambady & Rosenthal, 1992).

### Method

Targets were taken from the 140 students who participated in Study 2, whose overconfidence we had already captured by means of the GKQ. We excluded ten clips due to either redundant overconfidence scores<sup>5</sup> ( $n = 3$ ) or poor image quality ( $n = 7$ ). We then extracted the first 30s slice from each of the remaining videos (each job talk as videotaped in Study 2 was 5 min long). Finally, we removed the sound from all clips so that participants' only source of information was the targets' non-verbal behaviors.

The 30 s videos were then pretested to confirm that targets' overconfidence (i.e., GKQ scores) were positively related to raters' perceptions of targets' confidence. A total of 306 MTurk workers (56% men,  $M_{age} = 37.77$ ,  $SD = 12.52$ , ranging from 17 to 79) each watched a randomly selected set of five clips and assessed each targets' level of confidence. We aimed to have each target rated at least 10 times ( $M = 12$ ,  $SD = 1.45$ ) but due to randomization 10 clips failed to meet this target and were therefore excluded. Regressing raters' perceptions of targets' confidence onto targets' actual level of overconfidence (i.e., GKQ scores) revealed the expected positive relationship,  $b = 0.20$ , 95%CI[0.03,0.37],  $t(118) = 2.35$ ,  $p = .02$ ,  $d = 0.43$ . The final set of targets was therefore composed of these 120 remaining clips/targets, which were then crossed with our manipulation of competence.

To manipulate targets' competence we created four fake resumes aimed to cue either high or low competence. Another pre-test pilot study, in which 50 Amazon Mechanical Turk workers (60% men,  $M_{age} = 31.67$ ,  $SD = 7.53$ ) rated all four CVs on perceived competence revealed that the two intended high competence resumes were perceived to display significantly higher competence ( $M = 5.24$ ,  $SD = 1.15$ ;  $M = 5.34$ ,  $SD = 1.19$ ) than the two intended low competence resumes ( $M = 3.90$ ,  $SD = 1.40$ ;  $M = 4.00$ ,  $SD = 1.40$ ), all  $p < .001$ . Further analyses also showed that both the two high,  $t(98) = -0.35$ ,  $p = .72$ ,  $d = -0.07$ , and the two low,  $t(98) = -0.42$ ,  $p = .67$ ,  $d = -0.08$ , competence resumes did not significantly differ from each other. We then crossed each of the resumes with every video slice for a total of 240 overconfidence-competence combinations – half of those representing our high competence condition and the other half our low competence condition. These 240 combinations were rated by 725 MTurk workers (52% men,  $M_{age} = 35.96$ ,  $SD = 11.45$ , ranging from 18 to 74). Each overconfidence-competence combination was assessed for competence, confidence, overconfidence, and leadership suitability by an average of 10.76 ( $SD = 1.54$ ) independent raters, resulting in a total of 2584 ratings.

We told participants that clips were filmed in the context of a university course aimed to train postgraduate students for their upcoming job seeking process. At the end of the course, students had to hand in their resume and give a talk in front of a selection panel that would then decide which candidates to hire for a hypothetical leadership position. The participants' goal was to help in this decision by offering their own perceptions of several randomly presented candidates. To this end, we also showed them a brief description of the ostensible leadership position, which included a list of the most important tasks of the potential leaders. These tasks were inspired by and intended to resemble those of

<sup>5</sup> Three of the targets happened to have the exact same GKQ score as three other targets. Including all six of them would have resulted in having three levels of overconfidence represented twice in our sample. This was inconvenient for at least two reasons. First, those were the only levels of overconfidence represented by more than one student, causing unnecessary imbalance. Second, including all six students in the study would not add any new information relative to including only three of them. We thus decided to randomly pick three of those six students and exclude the other three from our pool of targets.

**Table 3**  
Means, standard deviations, and intercorrelations for Study 3.

	M	SD	1	2	3	4	5	6	7	8	9	10	11
1. Age	20.03	1.97											
2. Gender	0.18	0.38	0.18*										
3. GKQ	0.01	1.02	0.24**	0.11									
Low competence condition													
4. Perceived overconfidence	3.56	0.59	0.02	0.01	0.18								
5. Perceived confidence	4.42	0.75	0.02	-0.06	0.16	0.80**							
6. Perceived competence	4.13	0.45	0.15	-0.14	0.26**	0.27**	0.53**						
7. Leadership suitability	3.58	0.47	0.09	-0.19*	0.22*	0.42**	0.67**	0.83**					
High competence condition													
8. Perceived overconfidence	3.76	0.55	0.04	-0.01	0.19*	0.60**	0.54**	0.23*	0.36**				
9. Perceived confidence	5.00	0.70	0.08	-0.08	0.28**	0.62**	0.69**	0.33**	0.50**	0.81**			
10. Perceived competence	5.53	0.41	0.06	-0.16	0.10	0.10	0.28**	0.25**	0.29**	0.25**	0.53**		
11. Leadership suitability	4.92	0.40	0.11	-0.14	0.18	0.25**	0.42**	0.34**	0.43**	0.40**	0.68**	0.83**	

Note. As the candidate is the focus of the analyses, age, gender and GKQ scores are those of the candidates ( $N = 120$ ). Gender was coded as 0 = female and 1 = male. Overconfidence is represented by the standardized residual score after regressing confidence scores onto accuracy on the General Knowledge Questionnaire (GKQ). Perceptions of overconfidence, confidence, competence, and leadership suitability are all measured on a 7-point scale.

\*  $p < .05$ .

\*\*  $p < .01$ .

real management job offers in different professional online networks such as LinkedIn or InfoJobs.

Following each video, participants responded to several questions. To assess perceptions of overconfidence raters responded to the question, “How overconfident is this candidate?” on a 7-point scale, with 1 = *extremely underconfident* and 7 = *extremely overconfident*. To assess perceptions of confidence raters responded to the question, “How much confidence does this candidate have?” on a 7-point scale, with 1 = *extremely low confidence* and 7 = *extremely high confidence*. To assess perceptions of competence raters responded to the question, “How much competence does this candidate have?” on a 7-point scale, with 1 = *extremely low competence* and 7 = *extremely high competence*. To measure leadership suitability, participants responded to four questions adopted from Cole, Rubin, Field, and Giles (2007), “How likely is it that you would be interested in interviewing this candidate?”, “How likely is it that you would recommend this candidate be hired?”, “If hired for the theoretical position, how likely is it that this candidate would succeed in the job?”, “Taking everything into consideration regarding the applicant's interview extract and cv, what is your overall evaluation of this candidate?”, plus one question regarding the target's leadership potential, “How much potential does this candidate have as a leader?”. These five items constituted a reliable scale in both the high ( $\alpha = 0.97$ ) and low ( $\alpha = 0.97$ ) competence condition. Responses were given on a 6-point scale, with 1 = *very unlikely/negative* and 6 = *very likely/positive*. ICC (3,1) for absolute agreement = 0.86 based on mean ratings ( $k = 658$ ).

## Results

Table 3 provides the bivariate correlations between candidates' age, gender, overconfidence and the respondents' ratings in the two competence conditions.<sup>6</sup> To examine the effect of manipulated competence (i.e., resume) on leadership suitability, we contrasted suitability scores in the high,  $M = 4.92$ ,  $SD = 0.40$ , and low,  $M = 3.58$ ,  $SD = 0.47$ , competence conditions,  $t(119) = 31.35$ ,  $p < .001$ ,  $d = 5.75$ .

To examine the main effect of targets' overconfidence on leadership suitability (Hypothesis 1) we regressed leadership suitability scores (aggregating across the two conditions for our main effect test) onto targets' GKQ scores. This revealed a positive relationship between targets' overconfidence and ratings of their leadership suitability,  $b = 0.07$ ,  $SE = 0.03$ ,

95%CI[0.00,0.14],  $t(118) = 2.10$ ,  $p = .04$ ,  $d = 0.39$ .

To examine whether this effect of targets' overconfidence on leadership suitability was moderated by manipulated competence we used the repeated measures approach in GLM, fitting suitability ratings from the high and low competence conditions as the repeated factor, and GKQ scores as a covariate. This revealed no interaction between targets' overconfidence and manipulated competence in perceptions of leadership suitability,  $F(1,118) = 0.63$ ,  $p = .43$ . Overconfidence was positively related to suitability scores in both the high competence condition,  $b = 0.07$ ,  $SE = 0.04$ , 95%CI[0.00,0.14],  $t(118) = 1.98$ ,  $p = .05$ ,  $d = 0.36$ , and the low competence condition,  $b = 0.11$ ,  $SE = 0.04$ , 95%CI[0.02,0.19],  $t(118) = 2.52$ ,  $p = .01$ ,  $d = 0.46$ .

Perceived confidence was greater in the high competence condition,  $M = 5.00$ ,  $SD = 0.70$ , compared to the low competence condition,  $M = 4.42$ ,  $SD = 0.75$ ,  $t(119) = 11.10$ ,  $p < .001$ ,  $d = 2.04$ . Consistent with Hypothesis 2, regressing perceived confidence onto targets' overconfidence scores revealed a positive main effect,  $b = 0.15$ ,  $SE = 0.06$ , 95%CI[0.03,0.27],  $t(118) = 2.50$ ,  $p = .01$ ,  $d = 0.46$ . We observed no interaction between targets' overconfidence and manipulated competence in perceptions of confidence,  $F(1,118) = 2.29$ ,  $p = .13$ . Overconfidence was positively related to perceived confidence in the high competence condition,  $b = 0.20$ ,  $SE = 0.06$ , 95%CI[0.08,0.32],  $t(118) = 3.21$ ,  $p < .01$ ,  $d = 0.59$ , and marginally related to perceived confidence in the low competence condition,  $b = 0.12$ ,  $SE = 0.07$ , 95%CI[-0.07,0.26],  $t(118) = 1.73$ ,  $p = .09$ ,  $d = 0.32$ .

Perceived competence was greater in the high competence condition,  $M = 5.53$ ,  $SD = 0.41$ , than the low competence condition,  $M = 4.13$ ,  $SD = 0.45$ ,  $t(119) = 29.12$ ,  $p < .001$ ,  $d = 5.34$ . Consistent with Hypothesis 2, regressing perceived competence onto targets' overconfidence scores revealed a marginally significant positive relationship,  $b = 0.06$ ,  $SE = 0.03$ , 95%CI[0.00,0.13],  $t(118) = 1.97$ ,  $p = .05$ ,  $d = 0.36$ . We observed no interaction between targets' overconfidence and manipulated competence in perceptions of competence,  $F(1,118) = 2.47$ ,  $p = .12$ . Overconfidence had no relationship with perceived competence in the high competence condition,  $b = 0.04$ ,  $SE = 0.04$ , 95%CI[-0.03,0.12],  $t(118) = 1.15$ ,  $p = .25$ ,  $d = 0.21$ , and we observed a significant positive relationship in the low competence condition,  $b = 0.12$ ,  $SE = 0.04$ , 95%CI[0.04,0.20],  $t(118) = 2.92$ ,  $p < .01$ ,  $d = 0.54$ .<sup>7</sup>

<sup>6</sup> We did not control for any of the demographics in our analyses. Age was not significantly correlated with our study variables. Gender correlated with the leadership suitability ratings in the low competence condition ( $r = -0.19$ ,  $p = .04$ ). Controlling for gender does not change our conclusions.

<sup>7</sup> Note that the non-significant interaction reveals that the difference between these simple slopes is not significant but does not preclude the possibility of both significant and non-significant slopes across conditions.



Perceived overconfidence was greater in the high competence condition,  $M = 3.76$ ,  $SD = 0.55$ , than the low competence condition,  $M = 3.56$ ,  $SD = 0.59$ ,  $t(119) = 4.27$ ,  $p < .001$ ,  $d = 0.78$ . When we regressed participants' perceptions of overconfidence onto targets' overconfidence scores we observed an unexpected positive relationship,  $b = 0.10$ ,  $SE = 0.05$ , 95%CI[0.01,0.19],  $t(118) = 2.10$ ,  $p = .04$ ,  $d = 0.39$ . We observed no interaction between targets' overconfidence and manipulated competence in perceptions of overconfidence,  $F(1,118) = 0.01$ ,  $p = .93$ . Overconfidence had a positive relationship with perceived overconfidence in the high competence condition,  $b = 0.11$ ,  $SE = 0.05$ , 95%CI[0.01,0.21],  $t(118) = 2.12$ ,  $p = .04$ ,  $d = 0.39$ , and a marginal positive effect in the low competence condition,  $b = 0.10$ ,  $SE = 0.05$ , 95%CI[-0.00,0.21],  $t(118) = 1.91$ ,  $p = .06$ ,  $d = 0.35$ .

We next turned to [Hypothesis 3](#) and examined the indirect pathways via which targets' GKQ scores were related to our primary dependent variable of leadership suitability. To do so we used Model 4 of PROCESS ([Hayes, 2016](#)), fitting GKQ scores as the independent variable, our aggregated leadership suitability measure as the dependent variable, and perceptions of confidence, competence, and overconfidence simultaneously fitted as potential mediators. As expected we observed indirect effects via perceived confidence,  $IE = 0.04$ ,  $SE = .02$ , 95%CI [0.01,0.07], and perceived competence,  $IE = 0.04$ ,  $SE = 0.19$  95%CI [0.01,0.08], though not via perceived overconfidence,  $IE = -0.01$ ,  $SE = 0.01$ , 95%CI [-0.03,0.00]. To explore the possibility of moderated mediation, we examined whether these effects were robust to our manipulation of competence. In the low competence condition we again observed indirect effects via confidence,  $IE = 0.03$ ,  $SE = 0.02$ , 95%CI [0.00,0.07], and competence,  $IE = 0.08$ ,  $SE = 0.03$ , 95%CI[0.03,0.13], though again not via overconfidence,  $IE = -0.00$ ,  $SE = 0.01$ , 95%CI [-0.03,0.01]. In the high competence condition we yet again observed indirect effects via perceptions of confidence,  $IE = 0.05$   $SE = 0.02$ , 95%CI[0.02,0.08], though here neither for competence,  $IE = 0.03$ ,  $SE = 0.02$ , 95%CI[-0.02,0.07], nor overconfidence,  $IE = -0.01$ ,  $SE = 0.01$ , 95%CI[-0.03,0.00]. However, as in Study 2, these results must be interpreted with caution as they too are likely to be biased by endogenous mediators.

Again, we conducted a robustness check to inspect whether endogeneity issues might be biasing our results. Through this endogeneity testing, we controlled for a potential inflation of our results due to a common-source bias that could have occurred as the mediating variables (i.e., perceived confidence and perceived competence) and the dependent variable (i.e., leadership suitability) were measured from the same source. Other omitted variables may also threaten the unbiasedness and consistency of our estimates.

Using a similar procedure to that in Study 2, we estimated an instrumental variable specification. Our endogenous mediators are perceived competence and perceived confidence; to instrument these variables, we used sex (theoretically correlated with perceived competence) and individual differences in overconfidence (theoretically correlated with perceived confidence and weakly with competence). We estimated a SEM model with correlated disturbances for all endogenous variables in the model (i.e., the two mediators, perceptions of confidence and competence, and the dependent variable, leadership suitability). We first tested the strength of our instruments. Both excluded instruments were weak in the perceived confidence ( $F$ -test equivalent: 3.90) and perceived competence ( $F$ -test equivalent: 5.12) equations. These  $F$ -values unfortunately fall well below conventional standards for IV estimation ( $F$ -values larger than 10, see [Stock & Yogo, 2005](#)). This result suggests that both target sex and individual differences in target overconfidence are weak instruments, and so IV estimates will also be biased. These results also suggest that the PROCESS result will definitely be biased and untrustworthy. We tentatively report the results of our IV mediation analyses; however, these results have to be interpreted with caution. In the first stage, we observed significant paths from both measured overconfidence,  $b = 0.07$ ,  $p = .02$ , and sex,

$b = 0.10$ ,  $p = .01$ , to perceived competence. Measured overconfidence was also a significant predictor of perceived confidence,  $b = 0.16$ ,  $p = .01$ , whereas sex was not significantly related to perceptions of confidence,  $b = 0.09$ ,  $p = .24$ . In the second stage, we observed a significant effect for perceived competence on leadership suitability,  $b = 1.02$ ,  $p = .01$ , though the relationship between perceived confidence and leadership suitability was non-significant,  $b = 0.05$ ,  $p = .84$ . Note that given our model was just-identified (i.e., we had two excluded instruments for two endogenous predictors), we were again not able to test for the validity of the constraint made, that is, whether overconfidence scores and sex only affected perceptions of leadership suitability through their effect on perceptions of competence and confidence (i.e., the exclusion restriction). Theoretically, nonetheless, we draw from previous theorizing ([Anderson et al., 2012](#); [von Hippel & Trivers, 2011](#)) in suggesting the effect of overconfidence of perceived leadership suitability occurs solely because overconfidence is (mis)read by others as denoting superior competence and appropriately calibrated confidence.

In an exploratory manner informed by these results, we decided to run an IV specification with only one mediator (perceived competence), one instrument (measured overconfidence) and treated sex as a control variable rather than as an excluded instrument. This model makes empirical sense given the data at hand: Perceived competence is a significant predictor of leadership suitability, and we have slightly better instruments for perceived competence than we have for perceived confidence. This analysis revealed perceived competence to be significantly predicted by both sex  $b = 0.10$ ,  $p = .01$ , and measured overconfidence,  $b = 0.07$ ,  $p = .02$  (Note: Results for this first stage are similar to the first stage of the full model). In turn, leadership suitability was predicted by perceived competence,  $b = 1.12$ ,  $p < .01$ . Testing the strength of measured overconfidence, which served as our instrument for perceived competence yielded an  $F$  statistic of 5.25,  $p = .02$ , again indicating a weak instrument. Testing the indirect effect yielded a significant outcome,  $IE = 0.08$ ,  $p = .02$ . Although tentative and exploratory, this model still suffers from weak instruments. In all cases, the reduced form model, in which leadership suitability is predicted by overconfidence scores and sex, is consistent and the only model that can inform policy. In this model, perceptions of leadership suitability were significantly predicted by both measured overconfidence  $b = 0.08$ ,  $p = .02$ , and sex  $b = 0.11$ ,  $p = .01$ .

### Discussion

Consistent with [Hypothesis 1](#), participants' overconfidence – measured objectively as confidence over and above competence on a general knowledge test – was positively related to raters' appraisals of leadership suitability. We emphasize that raters saw only 30-s silent clips of participants' job talks. This effect emerged regardless of whether raters saw objective evidence of candidates' high versus low competence. Further, and providing support for [Hypothesis 3](#), our PROCESS results suggest that this effect was simultaneously mediated by perceptions of confidence and competence. However, we present only suggestive evidence for these pathways as all the models that we explored are untrustworthy to some extent, with the OLS (i.e., PROCESS) appearing to be the least trustworthy. We thus suggest interpreting the results of our mediation analyses with big caveats given the pervading endogeneity in our model.

In contrast to Study 1, and inconsistent with [Hypothesis 2](#), we found that participants were able to accurately infer candidates' overconfidence, although this effect was weak in comparison to the effects of the GKQ on perceived competence and confidence, and we found no evidence of indirect effects on leadership suitability via perceived overconfidence. It is notable however that the detection of candidates' overconfidence seems to occur only when raters are exposed to non-verbal displays in the absence of verbal communication (as in Study 3), but not when raters have access to both verbal and non-verbal displays of overconfidence (as in Study 1). This raises the possibility that verbal

communication may mask targets' overconfidence, making it more difficult to disentangle displays of confidence from displays of overconfidence. However, as we have no direct test of this possibility we raise it only as a potential avenue for future research.

#### Study 4

As per Study 3, we sought to test the possibility that behavioral displays of confidence might exert a positive effect in the context of leadership selection, even when that confidence is coupled with perceptions of low competence. We addressed this question via a sample of US voters in the context of the US presidential pre-selection during March–April 2016. We asked these voters to rate the confidence, competence, and likelihood of their voting for each of the four remaining candidates – Ted Cruz, Hillary Clinton, Bernie Sanders, and Donald Trump. We expected positive main effects for perceptions of both candidate competence and confidence. Our critical question, however, rested on the potentially interacting effects of confidence and competence. Thus, we aimed to test whether the hypothesized positive effects of candidate confidence on voting intentions would emerge regardless of perceptions of candidate competence.

#### Methods

Based on the effects observed during pretesting, we recruited 300 US participants through Crowdfunder and MTurk in April 2016. Prior to analysis we removed cases that were incomplete, failed our attention check, or duplicates (based on IP address), yielding a complete dataset of  $N = 254$  (125 females,  $M_{\text{age}} = 34.50$ ,  $SD = 11.44$ ). Of these participants, 86.60% were registered to vote. Democrats ( $n = 95$ ) provided ratings (i.e., confidence, competence, and voting intention) for Hillary Clinton and Bernie Sanders, and Republicans ( $n = 85$ ) provided ratings for Donald Trump and Ted Cruz, while Independents ( $n = 74$ ) provided ratings for all four candidates. We presented the candidates in a randomized order and participants rated candidate competence, confidence, and indicated the likelihood of their voting for each candidate.

Participants rated the confidence level of candidates on a scale from 0 = *extremely unconfident* to 100 = *extremely confident*. In this particular context, we could not manipulate or objectively measure competence (as in Study 3). For this reason, we asked participants to rate how effective candidates would be at handling 11 political issues, including the federal budget deficit, poverty and homelessness, economic conditions, the drug problem, environmental issues, the abortion issue, education policy, the situation(s) in Central America and the Middle East, terrorist threats within America, and refugee problems, on a 7-point scale from 1 = *extremely ineffective* and 7 = *extremely effective*. Cronbach's alpha varied between 0.97 and 0.98.

To measure our dependent variable – voting intentions for candidates – we asked participants, “If the election were taking place TODAY, how likely would you be to vote for presidential candidate X?” and measured their responses on a 7-point scale anchored by 1 = *extremely unlikely* and 7 = *extremely likely*.

We asked participants to indicate their gender, age, political orientation (0 = *extremely left wing* to 10 = *extremely right wing*), and subjective social economic status on a 10 rung self-anchoring scale (Singh-Manoux, Adler, & Marmot, 2003) and controlled for these variables in all analyses.

#### Results

Table 4 provides the descriptives and bivariate correlations between our measured variables.

Our primary interest was in assessing the generalized effects of confidence and competence on voting intentions, so we fitted a linear mixed effects model to the data and tested for the fixed effects of competence, confidence, their interaction term, and all controls. To control for candidate effects, we added candidate as a repeated function. We standardized confidence, competence, and voting intentions

for ease of interpretation. In line with Hypothesis 3, results revealed the expected main effects for competence,  $b = 0.72$ , 95%CI[0.66, 0.77],  $t(445.48) = 25.54$ ,  $p < .001$ ,  $d = 2.42$ , confidence,  $b = 0.16$ , 95%CI[0.10, 0.23],  $t(542.86) = 5.07$ ,  $p < .001$ ,  $d = 0.44$ , and their interaction,  $b = 0.09$ , 95%CI[0.04–0.14],  $t(526.79) = 3.57$ ,  $p < .001$ ,  $d = 0.31$ .

Examination of the simple slopes (Fig. 2) revealed that confidence was positively related to voting intentions at high levels of competence,  $b = 0.25$ , 95%CI[0.16,0.35],  $t(570.93) = 5.09$ ,  $p < .001$ ,  $d = 0.43$ . And despite the significant interaction between confidence and competence, even at low levels of competence, confidence had a weaker, though still significant positive relationship with voting intentions,  $b = 0.07$ , 95%CI[0.02,0.13],  $t(429.62) = 2.48$ ,  $p = .01$ ,  $d = 0.24$ .

Robustness checks revealed that the results were functionally unchanged when we excluded our identified covariates from the model: confidence,  $b = 0.16$ ,  $SE = 0.03$ , 95%CI[0.09,0.22],  $t(505.20) = 4.98$ ,  $p < .001$ ,  $d = 0.44$ ; competence,  $b = 0.71$ ,  $SE = 0.03$ , 95%CI[0.65,0.76],  $t(454.77) = 25.64$ ,  $p < .001$ ,  $d = 2.40$ ; interaction,  $b = 0.09$ ,  $SE = 0.02$ , 95%CI[0.04,0.14],  $t(525.09) = 3.54$ ,  $p < .001$ ,  $d = 0.31$ .

#### Discussion

Among partisans and independents alike, confidence appeared as the optimal candidate strategy, regardless of perceived competence. Confidence showed a positive and significant effect on voting intentions, higher when coupled with high competence, somewhat weaker but still significant when coupled with low competence. These findings from a real world political context are consistent with our experimental results from Study 3; candidates' overconfidence, either measured objectively through the GKQ or assessed through the interacting effects of perceived confidence and competence, is positively related to leadership suitability ratings.

It is worth noting that as the US sits at the high end of the self-promotion scale (Twenge & Campbell, 2009), the current findings should be examined in cultural contexts that vary in the extent to which self-promotion is endorsed (Loughnan et al., 2011; Meisel, Ning, Campbell, & Goodie, 2016; Yates et al., 1997). In cultures that sit toward the low end (Yamagishi, 1988), negative effects of overconfidence might be more pronounced, and/or the moderating effect of competence on confidence might be stronger. We might expect similar variations in organizational cultures to amplify or attenuate the social advantages of overconfidence. Nonetheless, within the political climate at the time of study, the advantages appear to have trumped the disadvantages.

#### Study 5

To explore possible longer term societal consequences of such a political climate, Study 5 modeled the effects of perceived confidence and competence on voting intentions as observed in Study 4 using an agent based simulation. Our goals were to examine: (1) whether overconfidence emerges as an adaptive strategic signal for attracting votes, (2) the consequences of candidates' overconfidence for voting behavior, and (3) the consequences of confidence signaling for election outcomes.

#### Method

We set up a modified Moran-process model (Moran, 1962; Nowak, 2006) that allowed us to examine (i) how candidates' overconfidence evolves in discrete time when defeated candidates imitate successful candidates, (ii) how this process affects the levels of election turnout, and (iii) the likelihood that competent candidates win elections.

Candidates in our model were characterized by two traits: a constant competence level,  $k$ , and an adaptable confidence strategy,  $c$ . We assumed that competence is a fixed trait determined by nature that cannot be influenced by the candidates. Thus, we assumed  $k \sim N(0, 1)$ . However, we accounted for the possibility that candidates can adapt

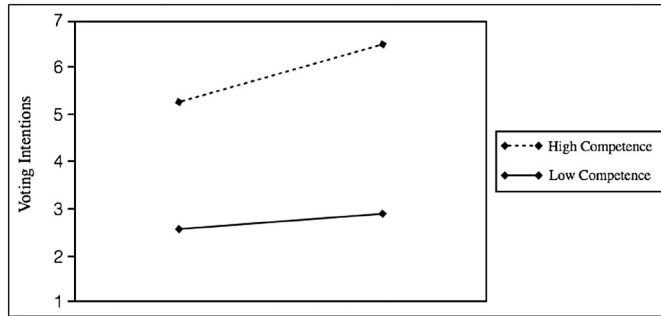
**Table 4**  
Means, standard deviations, and intercorrelations for Study 4.

	<i>M</i>	<i>SD</i>	1	2	3	4	5	6	7
1. Age	34.40	11.53							
2. Gender	0.51	0.50	−0.25**						
3. Political orientation	5.13	2.33	0.11**	0.10*					
4. Social economic status	5.90	1.63	0.06	−0.12**	−0.13*				
5. Confidence	0.00	1.00	0.17**	−0.14**	−0.08*	0.03			
6. Competence	0.00	1.00	0.03	−0.02	0.01	−0.16**	0.40**		
7. Confidence X competence	0.41	1.10	0.02	−0.07	0.20**	−0.06	−0.39**	0.01	
8. Voting intention	3.94	2.32	0.02	−0.03	0.01	−0.08*	0.39**	0.76**	0.05

Note. Democrats ( $n = 95$ ) and Republicans ( $n = 85$ ) provided ratings for two candidates and Independents ( $n = 74$ ) provided ratings for four candidates, resulting in a total number of 642 candidate ratings. Gender was coded as 0 = female and 1 = male. Political orientation was measured on a scale from 0 = extremely left wing to 10 = extremely right wing. Social economic status was measured on a 10-point scale. Perceptions of confidence and competence are standardized scores. Voting intention was measured on a 7-point scale.

\*  $p < .05$ .

\*\*  $p < .01$ .



**Fig. 2.** Study 4. Simple slopes of the interaction between confidence and competence on voting intentions. Slopes were achieved by recentering at  $\pm 1$  SD from the mean of competence. “High” and “low” confidence refer to  $\pm 1$  SD from the mean of confidence.

their level of strategic display of overconfidence,  $c$ , which we initialized as  $c \sim N(0, 0.1)$ .

In every time step of our simulation, four candidates were randomly selected from a candidate pool of 100 individuals and competed in an election. First, we calculated the probabilities of being voted for by an average voter for each of the four candidates. For this we employed a logistic function.

$$P(\text{'vote for candidate } i\text{'}) = 1/[1 + \exp(-v_i)], \quad (1)$$

with

$$v_i = \beta_1 k_i + \beta_2 c_i + \beta_3 k_i c_i, \quad (2)$$

wherein  $c_i$  and  $k_i$  were candidate  $i$ 's confidence strategy and competence level and the coefficients  $\beta_j$ ,  $j = 1, 2, 3$ , were those estimated in Study 4. Setting Eqs. (1) and (2) up like this yields that the attractiveness of candidates to voters in the simulation, i.e. their probability of being voted for, follows the same general patterns we observed in Study 4. Second, we determined the outcome of an electoral competition between the four candidates using the following procedure: (Step 1) The four candidates were put into random order. (Step 2) Candidate 1 was presented to an average voter, i.e., with probability  $P(\text{'vote for candidate } 1\text{'})$  the first candidate was voted for. In the event that candidate 1 was not voted for, candidate 2 was presented to the voter and voted for with probability  $P(\text{'vote for candidate } 2\text{'})$ , and so on. If, eventually, the voter did not vote for any of the four candidates, this voter was counted as a nonvoter.

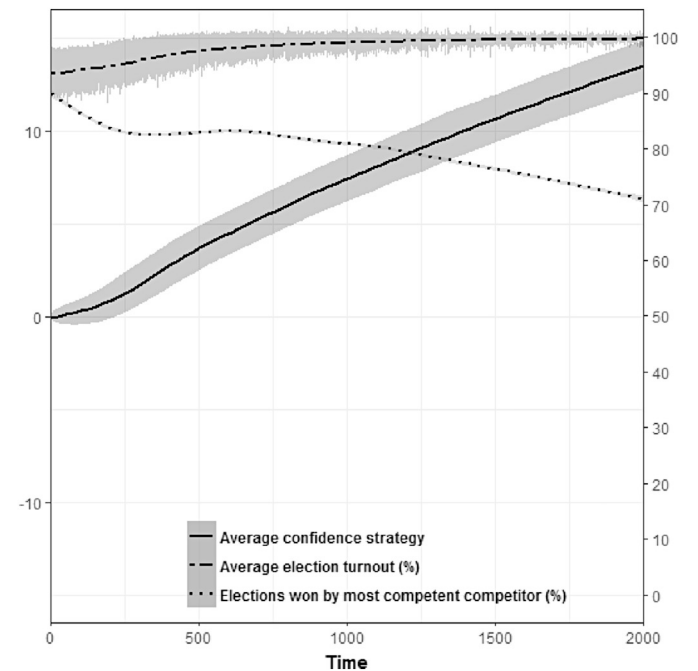
To determine the outcome of an election, Steps 1 and 2 were repeated 1000 times, modeling a population of 1000 voters. For simplicity, we assumed that the winner of the election was that candidate who was able to win a simple majority of the votes. After the outcome of the election in a given time step of the simulation had been determined, the

three candidates who did not win this election updated their confidence strategies. They did so by ‘imitating the best’, i.e., they copied the confidence strategy of that candidate who just won the election. However, in doing so they made mistakes, which we modeled as normally distributed random errors in the copying process:  $c_{loser} = c_{winner} + \varepsilon$ , where  $\varepsilon \sim N(0, 0.5)$ . i.i.d. for each defeated candidate.

One iteration of the simulation consisted of two phases: We initialized a population of 100 candidates (Phase 1) and we ran 2000 elections with subsequent strategy updating of the defeated candidates (Phase 2). The results presented below and displayed in Fig. 3 were obtained by averaging over the outcomes of 250 iterations of the simulation. The simulation was implemented in R 3.2.3.

### Results and discussion

Our simulations yield a clear cut result: When candidates continuously face voter preferences as we observed them in Study 4, they



**Fig. 3.** Study 5. Simulation results. Solid line: average confidence strategy (left y-scale); dashed line: average election turnout (in percent, right y-scale); dotted line: share of elections won by most competent competitor (in percent, right y-scale). Shaded areas indicate  $\pm 1$  SD around the means. Mean lines were smoothed for clearer display.

are incentivized to engage in an arms race for ever increasing levels of overconfidence. As can be seen in Fig. 3 (solid line), the average confidence strategy steadily increased in all iterations of the simulation. Given that Studies 1 through 4 found no adverse effects of high levels of perceived confidence, this was to be expected. Our simulation also shows, however, that the confidence arms race which candidates engage in has two noteworthy consequences. First, by continuously increasing their attractiveness to voters through imitating more successful competitors, candidates also motivate more and more people to vote (Fig. 3, dashed line). While this effect likely occurs positive to most, the confidence arms race also has an important downside. As can be seen in Fig. 3 (dotted line), the more candidates compensate for inferior competence by increasing confidence display, the less likely it becomes that the most competent competitor eventually wins an election.

While our simulation model naturally is based on several simplifications and abstractions, it does capture at least one important consequence of the voting preferences that we observed in Study 4: as long as high perceived confidence that is coupled with low perceived competence is not perceived as overconfidence, i.e. as long as braggadocio is not punished by voters, the average quality of elected candidates is likely to suffer in the longer run. This conclusion, however, is based on the assumption of time-fixed voting preferences. If voters were able to change their preferences as a reaction to less competent candidates being elected, the dismal prediction our simulation model yields would be debilitated.

## General discussion

Across four studies that combined field, laboratory, and experimental data, we found a consistent positive relationship between overconfidence and leadership ratings. We interpret these findings as evidence that overconfidence is interpersonally functional in leadership selection and attribute this to two observed reasons. Firstly, our data from Studies 1, 2, and 3 demonstrate that overconfidence gives rise to self-promoting behavioral signals that others interpret as the accurately calibrated confidence of a superior candidate, even when accompanied by objective evidence of the candidate's competence. Secondly, Study 2 provides suggestive evidence (endogeneity concerns remain and may well be biasing our coefficients) that this self-directed subterfuge buffers leadership candidates from an unsettling affective reaction to social stress, thus providing a palliative balm that boosts performance and social evaluation in the context of leadership selection. In Study 4 we shifted our focus from directly measuring people's overconfidence to examining how perceptions of confidence, competence, and their interaction relate to voting intentions. Consistent with our experimental data from Study 3, we saw that voters' perceptions of candidates' confidence positively predicted voting intentions, even when those same voters deemed the candidate incompetent. Finally, when we modeled the longer-term consequences of these voter preferences in Study 5, we saw unfettered confidence emerge as a runaway strategy that was accompanied by steadily decreasing competence of elected leaders.

## Theoretical implications

First, we suggest that the relationship between (over)confidence and perceptions of leadership potential observed in these studies positions (over)confidence as an intrapsychic antecedent that manifests leader-prototypic behaviors, triggering people's implicit leadership theories. The ubiquity of practitioner-focused articles on the importance of confidence to effective leadership suggests that confidence is a strongly sought-after quality among leaders and aspiring leaders. For instance, Forbes (Lipman, 2017) published an article describing "Why Confidence is Always a Leader's Best Friend", *inc.com* (2008) offered "Without Confidence, There is No Leadership", and HBR (Bregman, 2018) declared that "Great Leaders are Confident, Connected, Committed, and Courageous". These practitioner pieces not only reflect a

widely shared sentiment that confidence is a necessary quality for a leader to possess, but follow also from longstanding associations between confidence and leadership within the scientific literature (e.g., Stogdill, 1948). Indeed, Judge, Bono, Ilies, and Gerhardt (2002) report in their qualitative review and meta-analysis of the trait perspective in leadership research that "self-confidence" appears in all but two of the review papers that preceded their own work (Bass, 1990; Daft, 1999; House & Aditya, 1997; Kirkpatrick & Locke, 1991; Northouse, 1997; Stogdill, 1948; Yukl, 1998; Yukl & Van Fleet, 1992). Locke (1991, p. 26) goes so far as to state "that self-confidence is a necessary trait for successful leadership is undisputed." It is surprising then that confidence has not yet been explicitly identified as a component of implicit leadership theory. Our findings lend strong support to the role of confidence as an antecedent of many of the behaviors found to activate people's implicit leadership theories (i.e., outgoing, determined, decisive, strong character, strong convictions, charismatic, persuasive, persistent, outspoken). Further, our findings suggest that not just confidence but overconfidence too manifests the same behavioral expressions, triggering implicit theories of leadership which positively influence evaluations of leadership potential.

Second, our findings extend standing accounts of overconfidence in leadership that to date have focused on the suggestion that the psychological experience of power that accompanies a leadership role leads to higher levels of overconfidence (Fast et al., 2012). Our results provide clear evidence that overconfidence precedes leadership selection, although we expect that subsequent increases in power and prestige may exacerbate the expression of this trait.

Third, our results suggest that overconfidence provides a clear social utility, a finding which complements long standing explanations of self-enhancement as serving an intrapersonal function in the maintenance of self-esteem (Dunning et al., 1995; Taylor & Brown, 1988). We offer evidence that overconfidence increases perceptions of leadership potential by freeriding on the information value that observers derive from behavioral expressions of confidence and competence.

Fourth, using Brunswik's (1956) lens as a framework, we isolate and demonstrate the functional relationship between the intra- and interpersonal effects of overconfidence. We argue that these interpersonal benefits follow from the self-deceptive nature of overconfidence (von Hippel & Trivers, 2011) wherein overconfidence manifests as indistinguishable from accurately calibrated confidence. We suggest that in the short run such interpersonal advantages of overconfidence might serve to mitigate any personal costs associated with erroneous judgments that might arise from poorly calibrated self-knowledge. In other words, although self-deceptive overconfidence may impair judgment of future leaders (e.g., Ronay et al., 2017), its social utility in a selection context is such that the net effect of overconfidence may not be especially costly for the individual. In the long run however, the costs of errors in judgment are borne by all.

Our results from Study 2 point to the value of overconfidence as a buffer against declining positive affect in response to social evaluation. Our results suggest that this palliative association mediated the positive relationship between overconfidence and presentation quality. However, as our measure of affective robustness was not exogenous to our design and our instrument to address this weak, we encourage future research to test the robustness of our causal claims by using stronger instruments. Nonetheless, theoretically we suggest that because overconfidence leads people to estimate and track their own performance in an unrealistically positive way, they experience fewer moments of self-doubt and remain affectively robust in the context of social evaluation. As a result, their behaviors appear as strong and appropriately calibrated confidence. Our results from Study 1 suggest that this intrapsychic cushioning might also facilitate the (perceived) ability to manage pressure effectively, and to cope well with change and setbacks. Pressure, change, and setbacks are all potentially stress inducing, and so even an unrealistically steadfast belief in one's ability to traverse such uncertainties would presumably promote adaptive



coping.

### *Practical implications*

Considering the detrimental outcomes associated with overconfident leaders (e.g., Schrand & Zechman, 2012; Simon & Houghton, 2003), organizations should consider whether overconfidence is a trait worth screening for before promoting people to positions of power and influence. For example, instead of relying on holistic selection approaches, organizations might make more use of objective selection aids to select future leaders. Although HR professionals are typically well aware of the limitations associated with unstructured interviews, they sometimes still contend that unstructured interviews allow them to “read between the lines” and see for themselves whether someone is worth hiring (Highhouse, 2008; Lievens et al., 2005). Our finding that overconfidence was undetectable to selection consultants and indeed positively predicted their hiring recommendations suggests that leadership selection programs should be based on tests and exercises in which candidates can demonstrate their actual knowledge, skills, and abilities, allowing strong displays of confidence to be objectively benchmarked by observers right away.

Second, organizations could consider including a measure of overconfidence in their leadership selection procedures. The benefits of measuring overconfidence and being able to control for this trait during candidate selection clearly outweigh the modest cost of adding this non-invasive measure that takes no longer than a few minutes to complete. As our findings revealed that miscalibrated confidence on the GKQ (Michailova, 2010) was strongly related to miscalibrated confidence in presentation skills, we suggest a measure such as the GKQ is a generalizable tool for assessing self-enhancement. Moreover, the ease of assessing individual overconfidence provides feedback opportunities in the context of leadership development programs.

Our data from Study 4 speaks to the compelling nature of overconfidence in high stakes leadership selection contests – high levels of perceived confidence yielded an overall positive effect on voting intentions. The robust relationship we observed was driven by the positive relationship between confidence and voting intentions, when confidence was matched by competence. However, even at low levels of competence strong confidence continued to yield a positive relationship with voting intentions. When we plugged this observed relationship into a simulation model, confidence emerged as a runaway strategy for attracting votes, which, in turn, negatively affected the average competence level of the candidates elected. Thus, our findings suggest that overconfidence – versus underconfidence, or even appropriate levels of confidence – was the least costly error among American presidential candidates in 2016.

### *Limitations and future directions*

We acknowledge several limitations that serve as avenues for future research. First, we used the same measurement instrument across studies, which limits the generalizability of our findings. Although overprecision has been described as the most reliable way to measure overconfidence (Moore & Healy, 2008; Moore & Schatz, 2017; Moore & Swift, 2010), previous works have shown that the three different strands of overconfidence (i.e., overprecision, overestimation, and overplacement) manifest themselves differently under different conditions, and have different origins and consequences (Moore & Healy, 2008; Moore & Schatz, 2017). Hence, whether operationalizations of overconfidence other than overprecision would result in the same effects remains to be tested. One hypothesis for future research might be that measuring overconfidence specifically in one's leadership skills and abilities might lead to stronger effects within the context of leadership selection as individuals motivated toward leadership should be more likely to enhance their self-perceptions within contexts where their personal motivations are strongest.

Second, whereas our findings suggest that overconfidence might come at the expense of group and organizational outcomes, we did not investigate longer-term outcomes of overconfidence in the workplace. Future research should address this question by taking a multilevel approach, in terms of considering individual, group, and organizational outcomes of overconfidence over time. Moreover, future research might consider boundary conditions, such as group composition factors or task characteristics, which may facilitate or hinder the effects of overconfidence in the workplace.

The current research is the first to identify a relationship between overconfidence and affective robustness in the context of social stress. We further find suggestive evidence that affective robustness mediates the relationship between overconfidence and panel ratings of presentations. However, as our mediating variable was not exogenous to our study, and the instrument we employed to address this weak, future research might seek to test the robustness of the evidence we present here. More broadly, future work might explore whether the relationship between overconfidence and stress is limited to socially stressful contexts, or would it generalize to other forms of stress and stress induction? This might have implications for overconfident leaders' decisions and behaviors in times of crisis, along with attributions of overconfident leaders in crisis situations. We think this is an interesting vein for future research to explore.

Future research might also explore the broader antecedents and consequences of overconfidence. For instance, overconfidence may emerge as a competitive strategy in response to conditions of inequality (Loughnan et al., 2011; Ronay, Maddux, & von Hippel, *in press*). Attractiveness might also be related to overconfidence, such that the significant advantages associated with attractiveness (Maestripieri, Henry, & Nickels, 2017) might over time lead to an inflated sense of confidence. On the other hand, overconfidence might itself lead to attributions of greater attractiveness, or physical attractiveness might interact with overconfidence to influence attributions of competence, or even charisma. We can also imagine that observers might infer somewhat different qualities from men's versus women's behavioral displays of overconfidence (Rudman & Glick, 2001), or that observers' characteristics (e.g., their own levels of overconfidence or competence) might interact with the effects of overconfidence in leadership selection contexts. Finally, times of crisis might interact with leadership candidates' overconfidence to influence follower attributions and voting intentions. While beyond the scope of the present set of studies, future research can test these possibilities.

### *Conclusion*

These studies offer converging evidence that overconfidence provides an interpersonal *savoir faire* that has tangible benefits within the context of leadership selection. In part, this follows from an intrapsychic buffering against social stress that overconfidence affords, facilitating self-promoting behavioral signals which selection panels infer to reflect true competence and leadership potential. Our data also suggest that the current political climate, at least within the US, is well suited to overconfident candidates and that this might well be a match that stands the tests of time. While this is perhaps good news for the overconfident (although we expect they knew it all along), the results of our simulation model reveal longer term costs in terms of leader competence. It is perhaps a prudent moment for groups, organizations, and countries to consider what kind of leaders they really want. When faced with the seductive allures of overconfidence, we might do well to at least consider the less ostentatious virtues of humility.

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## References

- Allen, A. P., Kennedy, P. J., Cryan, J. F., Dinan, T. G., & Clarke, G. (2014). Biological and psychological markers of stress in humans: Focus on the Trier Social Stress Test. *Neuroscience and Biobehavioral Reviews*, 38, 94–124.
- Ambady, N., & Rosenthal, R. (1992). Thin slices of expressive behavior as predictors of interpersonal consequences: A meta-analysis. *Psychological Bulletin*, 11, 256–274.
- Anderson, C., Brion, S., Moore, D. A., & Kennedy, J. A. (2012). A status-enhancement account of overconfidence. *Journal of Personality and Social Psychology*, 103, 718–735.
- Anderson, C., & Kilduff, G. J. (2009). Why do dominant personalities attain influence in face-to-face groups? The competence-signaling effects of trait dominance. *Journal of Personality and Social Psychology*, 96, 491–503.
- Antonakis, J. (2012). Transformational and charismatic leadership. In D. V. Day, & J. Antonakis (Eds.). *The nature of leadership* (pp. 256–288). Thousand Oaks, CA: Sage Publications.
- Antonakis, J., Bastardoz, N., Jacquart, P., & Shamir, B. (2016). Charisma: An ill-defined and ill-measured gift. *Annu. Rev. Organ. Psych.* 3, 293–319.
- Antonakis, J., Bendahan, S., Jacquart, P., & Lalive, R. (2010). On making causal claims: A review and recommendations. *Leadership Quart.* 21, 1086–1120.
- Antonakis, J., Fenley, M., & Liechti, S. (2011). Can charisma be taught? Tests of two interventions. *Academy of Management Learning & Education*, 10, 374–396.
- Bales, R. F., Strodtbeck, F. L., Mills, T. M., & Roseborough, M. E. (1951). Channels of communication in small groups. *American Sociological Review*, 16, 461–468.
- Bartone, P. T. (2007). Test–retest reliability of the dispositional resilience scale-15: A brief hardness scale. *Psychological Reports*, 101, 943–944.
- Bartram, D. (2005). The Great Eight competencies: A criterion-centric approach to validation. *The Journal of Applied Psychology*, 90, 1185–1203.
- Bass, B. M. (1985). *Leadership and performance beyond expectations*. New York, NY: The Free Press.
- Bass, B. M. (1990). *Bass and Stogdill's handbook of leadership*. New York, NY: Free Press.
- Bass, B. M., & Riggio, R. E. (2006). *Transformational leadership*. Mahwah, NJ: Lawrence Erlbaum Associates.
- Berger, J., Cohen, B. P., & Zelditch, M., Jr (1972). Status characteristics and social interaction. *American Sociological Review*, 37, 241–255.
- Black, J. S., & Porter, L. W. (2000). *Management: Meeting new challenges*. Upper Saddle River, NJ: Prentice Hall.
- Bregman, P. (2018, July). Great leaders are confident, connected, committed, and courageous. *Harvard Business Review*. Retrieved from <https://hbr.org/2018/07/great-leaders-are-confident-connected-committed-and-courageous>.
- Brown, D. J., & Lord, R. G. (2001). Leadership and perceiver cognition: Moving beyond first order constructs. In M. London (Ed.). *Applied in psychology. How people evaluate others in organizations* (pp. 181–202). Mahwah, NJ, US: Lawrence Erlbaum Associates Publishers.
- Brown, J. D. (2010). Across the (not so) great divide: Cultural similarities in self-evaluative processes. *Soc. Psychol. Comp.* 4, 318–330.
- Brunswik, E. (1956). *Perception and the representative design of psychological experiments*. Berkeley, CA: University of California Press.
- Buehler, R., Griffin, D., & Ross, M. (1994). Exploring the "planning fallacy": Why people underestimate their task completion times. *Journal of Personality and Social Psychology*, 67, 366–381.
- Calder, B. J. (1977). An attribution theory of leadership. In B. M. Staw, & G. R. Salancik (Eds.). *New directions in organizational behavior* (pp. 47–62). New York, NY: St. Clair Press.
- Chatterjee, A., & Hambrick, D. C. (2007). It's all about me: Narcissistic chief executive officers and their effects on company strategy and performance. *Admin. Sci. Quart.* 52, 351–386.
- Cohen, J., Cohen, P., West, S. G., & Aiken, L. S. (2003). *Applied multiple regression/correlation analysis for the behavioral sciences* (3rd ed.). Hillsdale, NJ: Erlbaum.
- Cole, M. S., Rubin, R. S., Field, H. S., & Giles, W. F. (2007). Recruiters' perceptions and use of applicant résumé information: Screening the recent graduate. *Applied Psychology*, 56, 319–343.
- Colvin, C. R., Block, J., & Funder, D. C. (1995). Overly positive self-evaluations and personality: Negative implications for mental health. *Journal of Personality and Social Psychology*, 68, 1152–1162.
- Cosmides, L., & Tooby, J. (1996). Are humans good intuitive statisticians after all? Rethinking some conclusions from the literature on judgment under uncertainty. *Cognition*, 58, 1–73.
- Cronbach, L. J., & Furby, L. (1970). How we should measure "change": Or should we? *Psychological Bulletin*, 74, 68–80.
- Daft, R. L. (1999). *Leadership: Theory and practice*. Orlando, FL: Dryden Press.
- Daniel, K. D., Hirshleifer, D. A., & Sabrahmanyam, A. (1998). Investor psychology and security market under- and overreactions. *Journal of Finance*, 53, 1839–1885.
- Day, D. V., Shleicher, D. J., Unckless, A. L., & Hiller, N. J. (2002). Self-monitoring personality at work: A meta-analytic investigation of construct validity. *The Journal of Applied Psychology*, 87, 390–401.
- De Cremer, D., & Van Knippenberg, D. (2004). Leader self-sacrifice and leadership effectiveness: The moderating role of leader self-confidence. *Organ Behav Hum Dec*, 95, 140–155.
- De Vries, M. F. K. (1990). The organizational fool: Balancing a leader's hubris. *Human Relations; Studies Towards the Integration of the Social Sciences*, 43, 751–770.
- Den Hartog, D. N., House, R. J., Hanges, P. J., Ruiz-Quintanilla, S. A., Dorfman, P. W., Abdalla, I. A., ... Akande, B. E. (1999). Culture specific and cross-culturally generalizable implicit leadership theories: Are attributes of charismatic/transformational leadership universally endorsed? *Leadership Quart.* 10, 219–256.
- Driskell, J. E., Olmstead, B., & Salas, E. (1993). Task cues, dominance cues, and influence in task groups. *The Journal of Applied Psychology*, 78, 51–60.
- DuBois, P. H. (1957). *Multivariate correlational analysis*. New York, NY: Harper.
- Dunning, D., Leuenberger, A., & Sherman, D. A. (1995). A new look at motivated inference: Are self-serving theories of success a product of motivational forces? *Journal of Personality and Social Psychology*, 59, 58–68.
- Eden, D., & Leviatan, U. (1975). Implicit leadership theory as a determinant of the factor structure underlying supervisory behavior scales. *The Journal of Applied Psychology*, 60, 736–741.
- Ehrlinger, J., Johnson, K., Banner, M., Dunning, D., & Kruger, J. (2008). Why the unskilled are unaware: Further explorations of (absent) self-insight among the incompetent. *Organ. Behav. Hum. Dec.* 105, 98–121.
- Ekman, P., & Friesen, W. V. (1969). The repertoire of nonverbal behavior: Categories, origins, usage, and coding. *Semiotica*, 1, 49–98.
- Ekman, P., & Friesen, W. V. (1974). Detecting deception from the body or face. *Journal of Personality and Social Psychology*, 29, 288–298.
- Engelen, A., Neumann, C., & Schwens, C. (2015). Of course I can: The effect of CEO overconfidence on entrepreneurially oriented firms. *Entrepreneurship Theory and Practice*, 39, 1137–1160.
- Epitropaki, O., & Martin, R. (2004). Implicit leadership theories in applied settings: Factor structure, generalizability, and stability over time. *The Journal of Applied Psychology*, 89, 293–310.
- Epley, N., & Whitchurch, E. (2008). Mirror, mirror on the wall: Enhancement in self-recognition. *Pers. Soc. Psychol. B.* 34, 1159–1170.
- Fast, N. J., Sivanathan, N., Mayer, N. D., & Galinsky, A. D. (2012). Power and overconfident decision-making. *Org. Behav. Hum. Dec.* 117, 249–260.
- Fiedler, F. E. (1996). Research on leadership selection and training: One view of the future. *Admin Sci Quart.* 41, 241–250.
- Fitzsimmons, T. W., & Callan, V. J. (2016). Applying a capital perspective to explain continued gender inequality in the C-suite. *Leadership Quart.* 27, 354–370.
- Foti, R. J., & Hauenstein, N. (2007). Pattern and variable approaches in leadership emergence and effectiveness. *The Journal of Applied Psychology*, 92, 347–355.
- Foti, R. J., & Luch, C. H. (1992). The influence of individual differences on the perception and categorization of leaders. *Leadership Quart.* 3, 55–66.
- Galasso, A., & Simcoe, T. S. (2011). CEO overconfidence and innovation. *Management Science*, 57, 1469–1484.
- Gershonoff, A. B., & Foti, R. J. (2003). Leader emergence and gender roles in all-female groups: A contextual examination. *Small Gr Res*, 34, 170–196.
- Goel, A. M., & Thakor, A. V. (2008). Overconfidence, CEO selection, and corporate governance. *The Journal of Finance*, 63, 2737–2784.
- Goldhamer, H., & Shils, E. A. (1939). Types of power and status. *American Journal of Sociology*, 45, 171–182.
- Grijalva, E., Harms, P. D., Newman, D. A., Gaddis, B. H., & Fraley, R. C. (2015). Narcissism and leadership: A meta-analytic review of linear and nonlinear relationships. *Personnel Psychology*, 68, 1–47.
- Hahn, J., Ham, J. C., & Moon, H. R. (2011). The Hausman test and weak instruments. *Journal of Econometrics*, 160, 289–299.
- Harvey, N. (1997). Confidence in judgment. *Trends in Cognitive Sciences*, 1, 78–82.
- Hayward, M. (2007). *Ego check: Why executive hubris is wrecking companies and careers and how to avoid the trap*. Fort Lauderdale, FL: Kaplan.
- Hayward, M. L., & Hambrick, D. C. (1997). Explaining the premiums paid for large acquisitions: Evidence of CEO hubris. *Admin. Sci. Quart.* 42, 103–127.
- Hayward, M. L., Shepherd, D. A., & Griffin, D. (2006). A hubris theory of entrepreneurship. *Management Science*, 52, 160–172.
- Hayes, A. F. (2016, June). *PROCESS: A versatile computational tool for observed variable mediation, moderation, and conditional process modeling*. Retrieved from <http://www.afhayes.com/>.
- Highhouse, S. (2002). Assessing the candidate as a whole: A historical and critical analysis of individual psychological assessment for personnel decision making. *Personnel Psychology*, 55, 363–396.
- Highhouse, S. (2008). Stubborn reliance on intuition and subjectivity in employee selection. *Ind. Organ. Psychol.-US*. 1, 333–342.
- Hill, L. D., Gray, J. J., Carter, M. M., & Schuklin, J. (2005). Obstetrician-gynecologists' decision making about the diagnosis of major depressive disorder and premenstrual dysphoric disorder. *Journal of Psychosomatic Obstetrics & Gynecology*, 26, 41–51.
- Hiller, N. J., & Hambrick, D. C. (2005). Conceptualizing executive hubris: The role of (hyper-) core self-evaluations in strategic decision-making. *Strategic Manage. J.* 26, 297–319.
- Hirshleifer, D., Low, A., & Teoh, S. H. (2012). Are overconfident CEOs better innovators? *The Journal of Finance*, 67, 1457–1498.
- Ho, P. H., Huang, C. W., Lin, C. Y., & Yen, J. F. (2016). CEO overconfidence and financial crisis: Evidence from bank lending and leverage. *Journal of Financial Economics*, 120, 194–209.
- Hoelzl, E., & Rustichini, A. (2005). Overconfident: Do you put your money on it? *The Econometrics Journal*, 115, 305–318.
- Hogan, R., Curphy, G. J., & Hogan, J. (1994). What we know about leadership: Effectiveness and personality. *The American Psychologist*, 49, 493–504.
- Hogg, M. A. (2001). A social identity theory of leadership. *Personality and Social Psychology Review*, 5, 184–200.
- Hollander, E. P. (1958). Conformity, status, and idiosyncrasy credit. *Psychological Review*, 65, 117–127.
- Hollenbeck, J. R. (2008). The role of editing in knowledge development: Consensus shifting and consensus creation. In Y. Baruch, A. M. Konrad, H. Aguinis, & W. H. Starbuck (Eds.). *Opening the black box of editorship* (pp. 16–26). London, UK: Palgrave Macmillan.
- Hope, D. A., Gansler, D. A., & Heimberg, R. (1989). Attentional focus and causal attributions in social phobia: Implications from social psychology. *Clinical Psychology*

- Review, 9, 49–60.
- House, R. J., & Aditya, R. N. (1997). The social scientific study of leadership: Quo vadis? *J Manage*, 23, 409–473.
- Howell, J. M., & Avolio, B. J. (1992). The ethics of charismatic leadership: Submission or liberation? *Executive*, 6, 43–54.
- Hughes, B. L., & Beer, J. S. (2012). Medial orbitofrontal cortex is associated with shifting decision thresholds in self-serving cognition. *Neuroimage*, 61, 889–898.
- Inc.com (2008). Without confidence, there is no leadership. Retrieved from <https://www.inc.com/resources/leadership/articles/20080301/dao.html>.
- John, O. P., & Robins, R. W. (1994). Accuracy and bias in self-perception: Individual differences in self-enhancement and the role of narcissism. *Journal of Personality and Social Psychology*, 66, 206–219.
- Jones, S. C., & Schrauger, J. S. (1970). Reputation and self-evaluation as determinants of attractiveness. *Sociometry*, 33, 276–286.
- Judge, T. A., Bono, J. E., Ilies, R., & Gerhardt, M. W. (2002). Personality and leadership: A qualitative and quantitative review. *The Journal of Applied Psychology*, 87, 765–780.
- Judge, T. A., Piccolo, R. F., & Kosalka, T. (2009). The bright and dark sides of leader traits: A review and theoretical extension of the leader trait paradigm. *Leadership Quart*, 20, 855–875.
- Kaplan, H. B., Glantz, D., & Johnson, J. L. (2002). Toward an understanding of resilience. *Resilience and development* (pp. 17–83). Boston, MA: Springer.
- Kausel, E. E., Culbertson, S. S., & Madrid, H. P. (2016). Overconfidence in personnel selection: When and why unstructured interview information can hurt hiring decisions. *Org. Behav. Hum. Dec.* 137, 27–44.
- Kennedy, J. A., Anderson, C., & Moore, D. A. (2013). When overconfidence is revealed to others: Testing the status-enhancement theory of overconfidence. *Org. Behav. Hum. Dec.* 122, 266–279.
- Kirkpatrick, S. A., & Locke, E. A. (1991). Leadership: Do traits matter? *The Executive*, 5, 48–60.
- Kirschbaum, C., Pirke, K. M., & Hellhammer, D. H. (1993). The “Trier Social Stress Test”—A tool for investigating psychobiological stress responses in a laboratory setting. *Neuropsychobiology*, 28, 76–81.
- Klayman, J., Soll, J. B., Gonzalez-Vallejo, C., & Barlas, S. (1999). Overconfidence: It depends on how, what, and whom you ask. *Org. Behav. Hum. Dec.* 79, 216–247.
- Kobasa, S. C. (1979). Stressful life events, personality, and health: An inquiry into hardiness. *Personality and Social Psychology*, 37, 1–11.
- Kruger, J., & Dunning, D. (1999). Unskilled and unaware of it: How difficulties in recognizing one's own incompetence lead to inflated self-assessments. *Journal of Personality and Social Psychology*, 77, 1121–1134.
- Kruger, J., & Mueller, R. A. (2002). Skilled, unaware, or both? The better-than-average heuristic and statistical regression predict errors in estimates of one's own performance. *Journal of Personality and Social Psychology*, 82, 180–188.
- Krueger, J. I., & Wright, J. C. (2011). Measurement of selfenhancement (and self protection). In M. D. Alicke, & C. Sedikides (Eds.). *Handbook of self enhancement and selfprotection* (pp. 472–494). New York, NY: Guilford.
- Larrick, R. P., Burson, K. A., & Soll, J. B. (2007). Social comparison and confidence: When thinking you're better than average predicts overconfidence (and when it does not). *Org. Behav. Hum. Dec.* 102, 76–94.
- Li, J., & Tang, Y. I. (2010). CEO hubris and firm risk taking in China: The moderating role of managerial discretion. *Academy of Management Journal*, 53, 45–68.
- Lichtenstein, S., Fischhoff, B., & Phillips, L. D. (1982). Calibration of probabilities: The state of the art to 1980. In D. Kahneman, P. Slovic, & A. Tversky (Eds.). *Judgment under uncertainty: Heuristics and biases* (pp. 306–334). New York, NY: Cambridge University Press.
- Lievens, F., Highhouse, S., & De Corte, W. (2005). The importance of traits and abilities in supervisors' hirability decisions as a function of method of assessment. *J. Occup. Organ. Psych.* 78, 453–470.
- Lipman, V. (2017, May). *Why confidence is always a leader's best friend*. Forbes. Retrieved from <https://www.forbes.com/sites/victorlipman/2017/05/09/why-confidence-is-always-a-leaders-best-friend/#1dd92bb447be>.
- Locke, E. A. (1991). *The essence of leadership: The four keys to leading successfully*. New York, NY: Lexington Books.
- Lord, R. G., De Vader, C. L., & Alliger, G. M. (1986). A meta-analysis of the relation between personality traits and leadership perceptions: An application of validity generalization procedures. *The Journal of Applied Psychology*, 71, 402–410.
- Lord, R. G., Foti, R. J., & De Vader, C. L. (1984). A test of leadership categorization theory: Internal structure, information processing, and leadership perceptions. *Organ Behav Hum Dec*, 34, 343–378.
- Lord, R. G., Foti, R. J., & Phillips, J. S. (1982). A theory of leadership categorization. In J. G. Hunt, U. Sekaran, & C. Schriesheim (Eds.). *Leadership: Beyond establishment views* (pp. 104–121). Carbondale, IL: Southern Illinois University Press.
- Lord, R. G., & Maher, K. J. (1990). Alternative information-processing models and their implications for theory, research, and practice. *The Academy of Management Review*, 15, 9–28.
- Loughnan, S., Kuppens, P., Allik, J., Balazs, K., De Lemus, S., Dumont, K., & Haslam, N. (2011). Economic inequality is linked to biased self-perception. *Psychological Science*, 22, 1254–1258.
- Lu, H. J., & Chang, L. (2011). The association between self-deception and moral self-concept as functions of self-consciousness. *Pers. Individ. Dif.* 51, 845–849.
- Luthans, F., Luthans, K. W., Hodgetts, R. M., & Luthans, B. C. (2001). Positive approach to leadership (PAL): Implications for today's organizations. *Journal of Leadership Studies*, 8, 3–20.
- Luthans, F., & Peterson, S. J. (2002). Employee engagement and manager self-efficacy: Implications for managerial effectiveness and development. *J. Manage. Dev.* 21, 376–387.
- Maestripietri, D., Henry, A., & Nickels, N. (2017). Explaining financial and prosocial biases in favor of attractive people: Interdisciplinary perspectives from economics, social psychology, and evolutionary psychology. *The Behavioral and Brain Sciences*, 40, e19.
- Magee, J. C., & Frasier, C. W. (2014). Status and power: The principal inputs to influence for public managers. *Public Admin. Rev.* 74, 307–317.
- Magee, J. C., & Galinsky, A. D. (2008). Social hierarchy: The self-reinforcing nature of power and status. *Academy of Management Annals*, 2, 351–398.
- Makatsori, A., Duncko, R., Moncek, F., Loder, I., Katina, S., & Jezova, D. (2004). Modulation of neuroendocrine response and non-verbal behavior during psychosocial stress in healthy volunteers by the glutamate release-inhibiting drug lamotrigine. *Neuroendocrinology*, 79, 34–42.
- Malmendier, U., & Tate, G. (2005). CEO overconfidence and corporate investment. *The Journal of Finance*, 60, 2661–2700.
- Malmendier, U., & Tate, G. (2008). Who makes acquisitions? CEO overconfidence and the market's reaction. *Journal of Financial Economics*, 89, 20–43.
- McCormick, M. J. (2001). Self-efficacy and leadership effectiveness: Applying social cognitive theory to leadership. *J Leader Studies*, 8, 22–33.
- Meikle, N. L., Tenney, E. R., & Moore, D. A. (2016). Overconfidence at work: Does overconfidence survive the checks and balances of organizational life? *Research in Organizational Behavior*, 36, 121–134.
- Meisel, M. K., Ning, H., Campbell, W. K., & Goodie, A. S. (2016). Narcissism, overconfidence, and risk taking in US and Chinese student samples. *Journal of Cross-Cultural Psychology*, 47, 385–400.
- Michailova, J. (2010). *Development of the overconfidence measurement instrument for the economic experiment*. MPRA paper 26384. Germany: Christian Albrechts University of Kiel.
- Michailova, J., & Katter, J. K. Q. (2014). Quantifying overconfidence in experimental finance. *J. Behav. Account. Fin.* 4, 351–367.
- Mishina, Y., Dykes, B. J., Block, E. S., & Pollock, T. G. (2010). Why “good” firms do bad things: The effects of high aspirations, high expectations, and prominence on the incidence of corporate illegality. *Academy of Management Journal*, 53, 701–722.
- Moore, D. A., & Healy, P. J. (2008). The trouble with overconfidence. *Psychological Review*, 115, 502–517.
- Moore, D. A., & Schatz, D. (2017). The three faces of overconfidence. *Social and Personality Psychology Compass*, 11, e12331.
- Moore, D. A., & Swift, S. A. (2010). The three faces of overconfidence in organizations. In D. De Cremer, R. Van Dick, & J. K. Murnighan (Eds.). *Social psychology of organizations* (pp. 147–184). New York, NY: Routledge.
- Moran, P. A. P. (1962). *The statistical processes of evolutionary theory*. Oxford, UK: Clarendon Press.
- Murphy, S. C., von Hippel, W., Dubbs, S. L., Angilletta, M. J., Jr., Wilson, R. S., Trivers, R., & Barlow, F. K. (2015). The role of overconfidence in romantic desirability and competition. *Pers. Soc. Psychol. B.* 41, 1036–1052.
- Neuvica, B., De Hoogh, A. H., Van Vianen, A. E., Beersma, B., & McIlwain, D. (2011). All I need is a stage to shine: Narcissists' leader emergence and performance. *Leadership Quart*, 22, 910–925.
- Northouse, P. G. (1997). *Leadership theory and practice*. Thousand Oaks, CA: Sage Publications.
- Nowak, M. A. (2006). *Evolutionary dynamics: Exploring the equations of life*. Cambridge, MA: Harvard University Press.
- Offermann, L. R., Kennedy, J. K., Jr., & Wirtz, P. W. (1994). Implicit leadership theories: Content, structure, and generalizability. *Lead Quart.* 5, 43–58.
- Ong, C. W., Roberts, R., Arthur, C. A., Woodman, T., & Akehurst, S. (2016). The leader ship is sinking: A temporal investigation of narcissistic leadership. *Journal of Personality*, 84, 237–247.
- Owen, D., & Davidson, J. (2009). Hubris syndrome: An acquired personality disorder? A study of US Presidents and UK Prime Ministers over the last 100 years. *Brain*, 132, 1396–1406.
- Pillai, R. (1996). Crisis and the emergence of charismatic leadership in groups: An experimental investigation. *Journal of Applied Social Psychology*, 26, 543–562.
- Pillai, R., & Meindl, J. R. (1991). The impact of a performance crisis on attributions of charismatic leadership: A preliminary study. In: *Proc. 1991 eastern academy of management meetings* (Hartford, CT).
- Pillai, R., & Meindl, J. R. (1998). Context and charisma: A “meso” level examination of the relationship of organic structure, collectivism, and crisis to charismatic leadership. *J. Manage.* 24, 643–671.
- Radzevick, J. R., & Moore, D. A. (2011). Competing to be certain (but wrong): Market dynamics and excessive confidence in judgment. *Management Science*, 57, 93–106.
- Rapee, R. M., & Lim, L. (1992). Discrepancy between self- and observer ratings of performance in social phobias. *Journal of Abnormal Psychology*, 101, 728–731.
- Reuben, E., Rey-Biel, P., Sapienza, P., & Zingales, L. (2012). The emergence of male leadership in competitive environments. *J. Econ. Behav. Org.* 83, 111–117.
- Roll, R. (1986). The hubris hypothesis of corporate takeovers. *Journal of Business*, 59, 197–216.
- Ronay, R., Maddux, W., & von Hippel, W. (2019). Inequality Rules: Resource distribution and the evolution of dominance- and prestige-based leadership. *The Leadership Quarterly* (in press).
- Ronay, R., Oostrom, J. K., Lehmann-Willenbrock, N., & Van Vugt, M. (2017). Pride before the fall: Overconfidence predicts escalation of public commitment. *Journal of Experimental Social Psychology*, 69, 13–22.
- Rubin, R. S., Bartels, L. K., & Bommer, W. H. (2002). Are leaders smarter or do they just seem that way? Exploring perceived intellectual competence and leadership emergence. *Social Behaviors and Personality*, 30, 105–118.
- Rudman, L. A., & Glick, P. (2001). Prescriptive gender stereotypes and backlash toward agentic women. *Journal of Social Issues*, 57, 743–762.
- Schlenker, B. R., & Leary, M. R. (1982). Audiences' reactions to self-enhancing, self-degrading, and accurate self-presentations. *Journal of Experimental Social Psychology*,



- 18, 89–104.
- Schrand, C. M., & Zechman, S. L. (2012). Executive overconfidence and the slippery slope to financial misreporting. *Journal of Accounting and Economics*, 53, 311–329.
- Sedikides, C., & Alicke, M. D. (2012). Self-enhancement and self-protection motives. In R. Ryan (Ed.), *Oxford handbook of motivation* (pp. 303–322). New York, NY: Oxford University Press.
- Sedikides, C., Gaertner, L., & Toguchi, Y. (2003). Pancultural self-enhancement. *Journal of Personality and Social Psychology*, 84, 60–79.
- Sedikides, C., & Gregg, A. P. (2008). Self-enhancement: Food for thought. *Perspectives on Psychological Science*, 3, 102–116.
- Shaver, J. M. (2005). Testing for mediating variables in management research: Concerns, implications, and alternative strategies. *J. Manage*, 31, 330–353.
- Shipman, A. S., & Mumford, M. D. (2011). When confidence is detrimental: Influence of overconfidence on leadership effectiveness. *Leadership Quart*, 22, 649–665.
- Shondrick, S. J., Dinh, J. E., & Lord, R. G. (2010). Developments in implicit leadership theory and cognitive science: Applications to improving measurement and understanding alternatives to hierarchical leadership. *Lead Quart*, 21, 959–978.
- Simon, M., & Houghton, S. M. (2003). The relationship between overconfidence and the introduction of risky products: Evidence from a field study. *Academy of Management Journal*, 46, 139–149.
- Singh-Manoux, A., Adler, N. E., & Marmot, M. G. (2003). Subjective social status: Its determinants and its association with measures of ill-health in the Whitehall II study. *Social Science & Medicine*, 56, 1321–1333.
- Smith, J. A., & Foti, R. J. (1998). A pattern approach to the study of leader emergence. *Lead Quart*, 9, 147–160.
- Soll, J. B., & Klayman, J. (2004). Overconfidence in interval estimates. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, 30, 299–314.
- Stock, J. H., & Yogo, M. (2005). Asymptotic distributions of instrumental variables statistics with many instruments. In D. W. K. Andrews, & J. H. Stock (Eds.), *Identification and inference for econometric models: Essays in honor of Thomas Rothenberg*. Cambridge, UK: Cambridge University Press.
- Stogdill, R. M. (1948). Personal factors associated with leadership: A survey of the literature. *The Journal of Psychology*, 25, 35–71.
- Taggar, S., Hackew, R., & Saha, S. (1999). Leadership emergence in autonomous work teams: Antecedents and outcomes. *Personnel Psychology*, 52, 899–926.
- Taylor, S. E., & Brown, J. D. (1988). Illusion and well-being: A social psychological perspective on mental health. *Psychological Bulletin*, 103, 193–210.
- Tenney, E. R., Spellman, B. A., & MacCoun, R. J. (2008). The benefits of knowing what you know (and what you don't): How calibration affects credibility. *Journal of Experimental Social Psychology*, 44, 1368–1375.
- Twenge, J. M., & Campbell, W. K. (2009). *The narcissism epidemic: Living in the age of entitlement*. New York, NY: Free Press.
- Vardiman, P. D., Houghton, J. D., & Jinkerson, D. L. (2006). Environmental leadership development: Toward a contextual model of leader selection and effectiveness. *Leadership Org Dev J*, 27, 93–105.
- von Hippel, W., & Trivers, R. (2011). The evolution and psychology of self-deception. *The Behavioral and Brain Sciences*, 34, 1–16.
- Vrij, A., Edward, K., Roberts, K. P., & Bull, R. (2000). Detecting deceit via analysis of verbal and non-verbal behavior. *Journal of Nonverbal Behavior*, 24, 239–263.
- Watson, D., Clark, L. A., & Tellegen, A. (1988). Development and validation of brief measures of positive and negative affect: The PANAS scales. *Journal of Personality and Social Psychology*, 54, 1063–1070.
- Williams, E. A., Pillai, R., Deptula, B., & Lowe, K. B. (2012). The effects of crisis, cynicism about change, and value congruence on perceptions of authentic leadership and attributed charisma in the 2008 presidential election. *Leadership Quart*, 23, 324–341.
- Williams, E. F., & Gilovich, T. (2008). Do people really believe they are above average? *Journal of Experimental Social Psychology*, 44, 1121–1128.
- Winman, A., Hansson, P., & Juslin, P. (2004). Subjective probability intervals: How to reduce overconfidence by interval evaluation. *J. Exp. Psychol. Learn. Mem. Cog*, 30, 1167–1175.
- Wolff, S. B., Pescosolido, A. T., & Druskat, V. U. (2002). Emotional intelligence as the basis of leadership emergence in self-managing teams. *Lead Quart*, 13, 505–522.
- Yamagishi, T. (1988). The provision of a sanctioning system in the United States and Japan. *Soc. Psychol. Quart*, 51, 265–271.
- Yates, J. F., Lee, J. W., & Bush, J. G. (1997). General knowledge overconfidence: Cross-national variations, response style, and “reality”. *Org. Behav. Hum. Dec*, 70, 87–94.
- Yerkes, R. M., & Dodson, J. D. (1908). The relation of strength of stimulus to rapidity of habit-formation. *Journal of Comparative Neurology and Psychology*, 18, 459–482.
- Yukl, G. (1998). *Leadership in organizations*. Upper Saddle River, NJ: Prentice Hall.
- Yukl, G. A. (1999). An evaluation of conceptual weaknesses in transformational and charismatic leadership theories. *The Leadership Quarterly*, 10, 285–305.
- Yukl, G., & Van Fleet, D. D. (1992). Theory and research on leadership in organizations. In M. D. Dunnette, & L. M. Hough (Eds.), *Handbook of industrial and organizational psychology* (pp. 147–197). Palo Alto, CA, US: Consulting Psychologists Press.
- Zibarras, L. D., & Woods, S. A. (2010). A survey of UK selection practices across different organization sizes and industry sectors. *J. Occup. Organ. Psych*, 83, 499–511.